BOSTON PUBLIC LIBRARY
3 9999 10105 746 9
GBD
48/1

Surging Cities

GREATER BOSTON DEVELOPMENT COMMITTEE, INC.

FLEISCHMANN'S

Gen. 98-519
Also FA
8125.02-107

Digitized by the Internet Archive
in 2024 with funding from
Boston Public Library

https://archive.org/details/surgingcitiessec00grea

Surging Cities

GREATER BOSTON DEVELOPMENT COMMITTEE, INC.

Boston — The Hub of New England's Metropolis

Surging Cities

A SECONDARY SCHOOL TEXTBOOK IN TWO PARTS

Part I.
Urban Planning Problems and Solutions

Part II.
Greater Boston Acts for Tomorrow

by
Theodore T. McCrosky
Charles A. Blessing
J. Ross McKeever

1948

Greater Boston Development Committee, Inc., Boston, Massachusetts

GREATER BOSTON DEVELOPMENT COMMITTEE, INC.

80 Federal Street, Boston, Massachusetts

Chairman	Frederic C. Church
Vice Chairmen	H. D. Hodgkinson Daniel J. Lyne Thomas A. Pappas Nicholas E. Peterson Mrs. Joseph E. Scanlon
Treasurer	Charles Francis Adams
Assistant Treasurers	Ralph M. Eastman Allan Forbes
Chairman, Finance Committee	Ralph Lowell
Secretary	Daniel Bloomfield
Executive Director	Theodore T. McCrosky
Public Relations Director	William A. Beale

Jay R. Benton served as chairman from March, 1944 until January, 1948.

The Greater Boston Development Committee, Inc. includes in its membership more than 200 citizens of Boston and the surrounding cities and towns. It is a non-profit corporation, whose purpose is to advance the planning and construction of physical improvements for the Boston region. The work of the Committee is financed by private contributions and grants.

ACKNOWLEDGMENT

A generous grant from the Edward A. Filene Good Will Fund, Inc. made possible the publication of this book. The material presented comes within the scope of education for democracy. The book is primarily aimed at developing among the young citizens of Greater Boston a better understanding of planning problems, and at encouraging a broader participation in their solution.

COPYRIGHT

Greater Boston Development Committee Inc.

1948

F O R E W O R D

SECONDARY SCHOOL students sometimes dislike the subject of civics because, as sometimes taught, it is concerned for the most part with government as it would operate in a Utopia and does not deal realistically with the vital problems of city, state, and nation which, periodically, are featured in the press as matters of prime importance. This criticism, when it can be justified, is a valid one. Instruction in civics lacks value if the subject is looked upon by students as one to be studied, passed, and gratefully forgotten. The main purpose of teaching civics is to produce an abiding interest in issues that affect the public welfare and a disposition to translate that interest into intelligent civic action.

In the pages of this textbook will be found discussion of a problem which vitally concerns the people of Greater Boston. It is the problem of building for the future. It will not be easily and quickly solved. Interested citizens will be wrestling with it for years to come, what time boys and girls now in the schools will be part and parcel of our adult electorate. On the shoulders of those young men and women will rest, in part, the obligation of helping in its solution. It is a very practical task that does and will confront them. Its successful accomplishment will affect in a marked degree their health, happiness, and economic welfare. Its completion will mean better homes and highways, better business conditions, and finer recreational facilities for every one, young and old. A challenge here for the citizenry of today and of tomorrow!

Good teachers will not be content to present the information herein as something to be studied and learned. They will encourage activities on the part of the students which will lend interest and vitality to the learning process. They will organize forum discussions in school assemblies of different phases of the far-flung problem of regional planning. They will have experts on regional planning address those assemblies. They will stimulate boys and girls to make their own investigations of conditions that obtain in their own neighborhoods. They will urge their students to read the newspapers for regional planning news. They will cooperate in the organization throughout the school system of junior committees which will consult with and work in close cooperation with adult civic organizations.

Good teachers know that they must encourage motivating activities of the kind suggested to insure the outcomes at which they aim. They will not succeed, of course, in causing all students to become actively interested in solving this difficult problem. In the degree in which they do succeed they will make an important contribution to the welfare of the citizens of Greater Boston, and beyond.

JOHN J. MAHONEY

Boston, Massachusetts, March, 1948.

PREFACE

The collection of the material for this book was accomplished with the wholehearted cooperation of many individuals and many public and private agencies. The authors are most grateful for the friendly and helpful assistance they have received on every hand. It is not practical to prepare a complete list of acknowledgments, but particular credit is due the following:

The State Planning Board: Miss Elisabeth M. Herlihy, Chairman; and Mr. Harold J. Duffy, Metropolitan Project Engineer.

The Boston City Planning Board: Mr. William Stanley Parker, Chairman; and Mr. Thomas E. McCormick, Planning Engineer.

The State Department of Public Works: Rear Admiral William H. Buracker (ret.), Commissioner; Mr. Philip H. Kitfield, Chief Engineer; and Mr. Edgar F. Copell, Traffic Engineer.

The Metropolitan District Commission: Mr. William T. Morrissey, Chairman; and Mr. Edward F. Barry, Assistant Secretary.

The Metropolitan Transit Authority: Mr. Louis J. Mathieu, Assistant to the General Manager; and Mr. Clifford N. Cann, Consultant.

The Port of Boston Authority: Mr. J. A. Crothers, Director.

The Housing Association of Metropolitan Boston: Mr. William C. Loring, Executive Director.

The foreword of this book was contributed by Dr. John J. Mahoney, Professor of Education in Boston University, and author of "For Us The Living." Dr. Mahoney has taken a keen interest in the subject matter of *Surging Cities* and the text has benefited a great deal as the result of his constructive recommendations.

In preparing those sections of the book that treat the historical background of Greater Boston, information has been drawn extensively from the notable memorial volume "Fifty Years of Boston," edited by Elisabeth M. Herlihy, and published in commemoration of the Tercentenary of 1930.

The authors wish to record that a committee of teachers from the Boston high schools rendered a most valuable service by reviewing the entire text of the book, with particular reference to its general content and style of presentation. This committee consisted of Dr. William F. Looney, Head Master of the High School of Commerce, serving as chairman; Dr. John E. Collins, Master, Boston Public Latin School; Mr. Ralph F. V. Quinn, Head of the History Department of Boston English High School; and Mr. George F. Aherne, Submaster, Patrick T. Campbell Intermediate School. Their many thoughtful suggestions have aided greatly in the difficult task of covering the subject matter simply and concisely to meet secondary school requirements.

The Executive Director wishes to express his appreciation for the assistance rendered by Mr. William A. Beale, Public Relations Director, who edited the entire manuscript and made substantial contributions to certain chapters. He also wishes to thank Mrs. Virginia C. Darling and Miss Margaret H. Flynn, secretaries, for their loyal and devoted services.

Most of the freehand drawings in the text are the work of Mr. Noel Dant. Some were drawn by the co-authors, Messrs. Charles A. Blessing, Regional Planning Engineer, and J. Ross McKeever, Principal Planning Analyst, on the staff of the Committee.

THEODORE T. MCCROSKY

TABLE OF CONTENTS

Page

Acknowledgment 5
Foreword 7
Preface 8
List of Illustrations 18
Introduction 26

PART I. URBAN PLANNING PROBLEMS AND SOLUTIONS

I. The Evolution of Cities 32
Early Settlements — Formation and Protection 32
Cities of Earliest Times 33
Classic Athens and Rome 34
Medieval Market Towns 35
Street Patterns in Medieval Towns 36
Development of Port Cities 37
Railroad Junction Cities 39
Industrial Metropolises 41

II. Growth of Five American Cities 42
New York City 42
Founding of New York — Fortified Trading Town 42
Major Transport Center 43
New York's First City Plan 43
Expanding City 43
Metropolis and Region 44
Population 44
Rapid Transit 45
Parkways and Express Highways 46
Bridges and Tunnels 46
Parks and Playgrounds 46
Housing 46
Regional Plan of New York and Its Environs 47
New York City Planning Commission 47
Looking toward the Future 47
Boston 48
Early Settlement — Growth of the Port 48
Development of Industries 49
Regional Railroad Center 49
Land Reclamation 50

TABLE OF CONTENTS (Continued)

Page

Street Pattern 50
City Planning in Boston 50
Metropolitan Planning 52
Present Problems 52
Philadelphia 53
Early Settlement 53
Penn's Famous Plan 53
Market Town 54
Major Transport Center 54
Metropolis — Consolidation of Communities 55
Long-Range Planning 55
Chicago 57
City of Rapid Growth 57
Early Street Plan 57
Market Town 57
Railroad and Manufacturing City 57
Pattern of Development 58
Chicago Fire 58
The World's Fair and City Planning 59
Regional Planning 60
Chicago Plan Commission 60
Los Angeles 62
Early Spanish Settlement — De Neve's Plan 62
Market Town 62
Major Transport Center 62
Transit 63
Water Supply 63
The Metropolis 64
City and County Planning 65

III. Residential Problems 66
New Community Growth and Its Guidance 66
Decentralization 66
Past Mistakes 66
General Solutions 69
Model Town near Chicago 70
Letchworth and Welwyn 72
British Post-War Program for New Towns 73
Radburn, New Jersey 73
Greenbelt, Greenhills and Greendale 74

TABLE OF CONTENTS (Continued)

Page

Neighborhood Shopping Centers ... 74
Stimulation of Large Scale Rebuilding ... 76
Decayed Residential Areas and Their Redevelopment ... 76
Overcrowding ... 76
Jumbled Land Uses ... 77
Obsolescence and Deterioration of Structures ... 77
Health Conditions ... 78
Clearance and Rebuilding ... 78
Neighborhood Units ... 79
Examples of Private and Public Rebuilding ... 79
Parks and Play Space ... 82

IV. Traffic, Transit and Commuting Railroads ... 86
Traffic Congestion and Remedies ... 86
Conflicting Purposes of Streets and Highways ... 86
Decentralization and Traffic Congestion ... 87
Obsolescence and Accidents ... 87
Express Highways and Parkways ... 89
Regional Highway Patterns ... 93
Off-Street Parking and Loading Facilities ... 93
Transit and Commuting Railroads ... 94
Street Cars, Buses, Elevateds and Subways ... 94
Relation of Highways to Transit ... 96
Commuting Railroads ... 98

V. Business, Industry and Movement of Goods ... 100
Central Business Districts ... 100
Location, Concentration and Congestion ... 100
Patterns for Future Rebuilding ... 101
Industry ... 105
Light Industry ... 105
Heavy Industry ... 106
Diversification of Industry ... 107
Planned Industrial Districts ... 108
Relation of Industry to Residential Locations ... 109
Movement of Goods ... 109
Port Facilities ... 109
Rail Freight ... 111
Need of Coordinated Transportation ... 113

TABLE OF CONTENTS (Continued)

Page

VI. Airports, Public Buildings and Utility Services 114
Planning for Tomorrow's Air Travel 114
Growth of Air Transportation 114
The Airport Site Problem 115
Features of New Major Airports 115
Number and Type of Airports 117
Planning and Distribution of Regional Airfields 118
Public Buildings and Civic Centers 119
Influence of the Chicago World's Fair 119
Civic Centers — Present and Future 120
Neighborhood Centers 121
Public Utilities and Services 121
Utilities — Private and Public Ownership 121
Water Supply 122
Sewage Disposal 122

VII. Four Outstanding City Plans 124
Peiping 124
Paris 125
Washington 128
London 129

VIII. Importance of the Regional Plan 132
Need for Regional Planning 132
Trends in Metropolitan Planning and Government 133
The Functional Basis for Regional Planning and Administration 134

IX. The Planning Process 136
Universal Application of Planning Principles 136
Getting the Facts 136
Analysis of the Facts 137
Making the Master Plan 137
Carrying out the Plan 138

X. Legal Framework for Planning 140
Nature and Scope of Planning 140
State Planning Laws for Municipalities 140
County and Regional Planning Boards 141
State Planning Boards and Development Commissions 141

TABLE OF CONTENTS (Continued)

Page

National Planning . . . 141
Master Plan and Official Map . . . 141
Subdivision Control . . . 142
Zoning . . . 143
State Zoning Laws . . . 143
Zoning Ordinances and Maps . . . 143
Local Zoning Administration . . . 143
Zoning as a Protecting and Guiding Force . . . 145
Building Codes . . . 146
Housing Laws . . . 146

XI. Financing the Plan . . . 148
Financial Difficulties of Cities . . . 148
Necessity for Long-Range Financing . . . 150
Capital Programming . . . 151
Methods of Financing Capital Improvements . . . 151
Three Steps for Public Works Programs in Cities . . . 152
Capital Programs for Metropolitan Regions . . . 153
Private Rebuilding Operations . . . 154
Conclusion . . . 155

PART II. GREATER BOSTON ACTS FOR TOMORROW

I. The Heritage of Past Growth . . . 158
The Metropolis as a Physical Unit . . . 158
Evolution of the Highway Pattern . . . 160
Development of Railroads . . . 161
Street Car Lines . . . 163
Rapid Transit . . . 163
Land Reclamation . . . 164
Water Supply . . . 165
Sewerage Systems . . . 167
Economic Development of Greater Boston . . . 170
Educational Resources . . . 172

II. The People of Greater Boston . . . 174
Population Growth, City of Boston . . . 174
Population of Boston and Its Metropolitan District . . . 175
Population of Metropolitan District and Massachusetts . . . 176
Natural Increase of Population . . . 176

TABLE OF CONTENTS (Continued)

Page

National Origins of Greater Boston's Population 176
Immigration from Abroad 177
Internal Migration 177
Working Population 178
Increasing Age of the Population 178
Planning for Future Population Needs 179

III. Planning for Residential Development 180
Locations for Living 180
Greater Boston Housing Types 181
Housing Types of the Future 183
Greater Boston Housing Facts and Figures 183
Relieving the Housing Shortage 184
Extent of the Housing Shortage 185
Private Construction 185
Temporary Government Housing 186
Permanent Houses Constructed by Local Governments ... 186
New Construction on Vacant Land 187
Extent of Unsubdivided Land 188
Rebuilding Old Neighborhoods 189
Private Redevelopment 189
The Boston Housing Authority 189
A Look at the Future 191

IV. Traffic and Transit Plans 192
Traffic 192
Need for Express Highways 192
Major Highway Problems 192
Origin and Destination Survey of Traffic 194
Joint Board for the Metropolitan Highway Plan 195
Radial Expressways recommended by the Joint Board 195
Belt Route 199
Embankment Road Extension 200
Mystic River High Level Bridge 200
Outer Circumferential Highway — Route 128 201
Automobile Parking 201
Public Off-Street Parking Facilities in Boston 202
Proposed Garage under Boston Common 204
Parking Spaces at Outlying Rapid Transit Stations 204
Parking Meters 204

TABLE OF CONTENTS (Continued)

Page

Transit ... 204
Metropolitan Transit Authority ... 205
Plan of the Rapid Transit Commission ... 207
General Discussion of the Transit Plan ... 208
Most Urgent Transit Projects ... 210
Use of Expressways for Express Bus and Street Car Service ... 210

V. Railroad, Port and Aviation Improvements ... 212
Railroads ... 212
The Three Major Railroads ... 212
Railroad Passenger Stations ... 214
Railroad Passenger Commuting Service ... 215
Rail Freight Connections ... 216
The Port of Boston ... 217
The Five Waterfronts of the Port ... 217
Boston Proper ... 217
Charlestown ... 218
Chelsea ... 218
East Boston ... 218
South Boston ... 218
The Port of Boston Authority ... 219
Program of Port Construction ... 220
Hoosac Terminal ... 220
Mystic Terminal ... 221
Boston and Albany Terminal ... 221
Castle Island Terminal ... 221
The Old Boston Waterfront ... 221
The Port of Boston and Its Competitors ... 222
Coastal and Intercoastal Shipping ... 223
Highway Access to Boston's Piers ... 224
Aviation ... 225
Types of Air Service ... 225
Existing Airfields in the Boston Region ... 225
State Planning Board's Airport Program ... 228
Development of Logan Airport ... 229
Helicopters ... 231

VI. Business and Industrial District Proposals ... 232
Business ... 232
Downtown Business Center ... 232

TABLE OF CONTENTS (Continued)

Page

Traffic Congestion in Central Boston 234
Union Motor Truck Terminals 234
Market District 235
Park Square Business District 236
Suburban Business Centers 237
Industry 238
Industrial Locations 239
Suggestion for a Planned Industrial District in the South Bay Area 239
Proposal to Fill in South Bay and Fort Point Channel 240
Industry in Open Country 241

VII. Parks, Public Buildings and Schools 244
Parks 244
The City of Boston's Park System 244
Park District of the Metropolitan District Commission 245
Neighborhood Park Planning for the Future 248
Trustees of Public Reservations 249
The Bay Circuit Proposal 249
Public Buildings 250
Government District for Boston 250
Police and Fire Stations 251
Public Libraries 251
Public Schools 252

VIII. Expansion of Regional Government 254
Changes in Municipal Boundaries 254
The Metropolitan District Commission 256
Other Regional Agencies 259
Proposals for a More Centralized Metropolitan Government 259
Current Trends in Metropolitan Government 260
The Responsibility for Metropolitan Planning 261

IX. Legal Tools for Planning and Action 262
Town and City Planning Boards 262
Boston City Planning Board 263
Massachusetts State Planning Board 263
Subdivision Control 264
Zoning 265
State Laws 265

TABLE OF CONTENTS (Continued)

Page

City of Boston . . . 265
Cities and Towns in the Environs of Boston . . . 266
Building Codes . . . 266
Housing Laws . . . 266

X. Summary of Plans and Proposals for Greater Boston's Future . . . 268
The Emerging Master Plan . . . 268
Housing . . . 268
Traffic and Parking . . . 269
Transit . . . 271
Port . . . 271
Airports . . . 272
Business and Industry . . . 272
Parks and Playgrounds . . . 273
Public Buildings . . . 273
Sewage Treatment Plants . . . 273
Regional Planning and Administration . . . 274

XI. The Citizen's Responsibility for the Future . . . 276
Citizen Interest and Understanding . . . 276
Organizing for Citizen Action . . . 276
Committees for Action . . . 277
Speakers' Bureaus . . . 277
Public Relations Committees . . . 277
Legislative Committees . . . 277
Junior Committees . . . 278
Support of Candidates for Public Office . . . 278
Importance of Continuous Effort . . . 279

Bibliography . . . 280

Glossary . . . 283

LIST OF ILLUSTRATIONS

	Page
Boston — The Hub of New England	*Frontispiece*
Paul Revere's House	26
Transportation — Today and Yesterday	27
The Chicago Sky Line	28
Concord, Mass.	29
Manhattan — Towers, Congestion, Decay	30
Prehistoric Swiss Lake Village	32
Cliff Dwellings in New Mexico	32
The Acropolis of Athens	33
Miletus, Asia Minor	33
Colchester, England	33
Modern Rome	34
The Heritage of Ancient Rome	34
Carcassonne in Southern France (two sketches)	35
Early Saxon Manor, England	36
Laxenburg, Germany	36
Medieval Edinburgh, Scotland	37
Malines, Belgium	38
The Port of New York	38
Port of Antwerp, Belgium	39
Genoa, Italy	39
Venice, Italy	39
Rio de Janeiro, Brazil	39
Wenchow, China	40
Hongkong	40
St. Louis, Missouri	40
The City and Port of New Orleans	41
New York about 1626	42
New York — Costello Plan of 1660	42
The New York Skyline as Seen from Brooklyn — 1840 and 1948	43
The Commissioners' Plan of New York, 1811	44
The New York Region, Showing Pattern of Growth — 1800 and 1860	44
1900 and 1935	45
Manhattan Island Today	45
George Washington Bridge	46
Henry Hudson Bridge	47
Jones Beach, Long Island	47
Hales Map of Boston Region, 1819	48
Boston's First Municipal Building	49
The Old Boston Waterfront and the Business Center	49
Topographic Model of Boston Region	50
Boston's Commonwealth Avenue	51
The Boston Public Garden	51
Downtown Boston Today	51
The Boston Region, Showing Pattern of Growth — 1700, 1776, 1850, 1910, 1948	52

LIST OF ILLUSTRATIONS (Continued)

	Page
William Penn's Plan of Philadelphia, 1683	53
Benjamin Franklin Parkway	53
The Philadelphia Region, Showing Pattern of Growth — 1800, 1850, 1930	54
Independence Hall, Philadelphia	55
The Philadelphia Metropolitan Region	55
Philadelphia in 1702	56
Present Day Philadelphia	56
Fort Dearborn in 1820	57
Chicago's Blighted Residential Areas	58
Downtown Chicago at Night	59
The Chicago Region, Showing Pattern of Growth — 1857, 1873, 1900, 1936	59
Michigan Avenue	60
Fort Dearborn in 1830	61
Chicago in 1853	61
Chicago's Lake Michigan Waterfront	61
De Neve's Plan for the Pueblo of Los Angeles, 1781	62
Los Angeles in 1853	62
The Los Angeles Region, Showing Pattern of Growth — 1877, 1907, 1920, 1940	63
The Los Angeles Region (Air View)	64
A Section of Downtown Los Angeles	65
Gridiron Street System	66
Overcrowding the Land	67
Jumbled Land Uses	67
Little Air and Sunshine	67
Premature Subdivisions	68
For Want of a Playground (two photographs)	69
Contrast of Good and Bad Subdivision Layout	70
New Town near Chicago	71
Good Residential Layout	71
Plan of Letchworth	72
Sketch Plan of Stevenage	72
Part of Welwyn	73
Radburn, New Jersey	73
Radburn's Cul-de-sac Street Unit	73
Greenbelt, Maryland	74
Plan of Greenhills, Ohio	75
Farmers Market, Los Angeles	75
Drive-In Shopping Centers — College Park, Washington, D. C.	75
Bellevue, Seattle	75
Fresh Meadows Housing Development	76
Boston's Crowded North End	76
Mixed Business and Residences	77
The West End, Boston	77
The South End, Boston	77
A Blighted Area	78
Obsolescence and Decay	78

LIST OF ILLUSTRATIONS (Continued)

Page

Cidade dos Motores, Brazil ... 79
A Neighborhood Unit ... 79
Public Housing Developments — Tampa, Florida (before and after) ... 80
Willert Park, Buffalo (before and after) ... 80
Fort Greene Houses, Brooklyn, N. Y. C. ... 80
Parkchester, The Bronx, New York City ... 81
Amphitheater in St. Louis, Missouri ... 81
Hartford, Connecticut ... 82
The Boston Public Garden ... 83
Looking Across Manhattan Island ... 83
The Palisades along the Hudson River ... 83
A Playlot ... 84
Plan for a Playlot ... 84
Plan for a Playground ... 85
Typical Plan for a Playfield ... 85
Typical Plan for an Athletic Field ... 85
Typical Plan for a Neighborhood Park ... 85
Traffic Congestion (two photographs) ... 86
Haymarket Square, Boston ... 87
Traffic Congestion (two photographs) ... 87
Waterfront Highway, Pittsburgh ... 88
Depressed Express Highway, Hartford ... 88
Chicago's Outer Drive (two views) ... 88
Express Parkway Approach to Triborough Bridge, New York ... 89
Miller Highway, New York ... 89
Franklin D. Roosevelt Drive, New York ... 89
Traffic Interchange on Henry Hudson Parkway, Manhattan ... 89
Henry Hudson Parkway, Manhattan ... 90
Cross Bay Boulevard and Beach Channel Drive, Queens, New York City ... 90
Southern State Parkway and Cross Island Parkway, Long Island ... 91
Triborough Bridge Approaches ... 91
Southern Parkway Section of Belt Parkway, Queens, New York City ... 91
Grand Central Parkway, Queens, New York City ... 92
Davidson Highway, Detroit ... 92
Cahuenga Freeway, Los Angeles ... 92
Merritt Parkway, Connecticut ... 92
Three Level Traffic Separation, Queens, New York City ... 93
Lake Front Parking Space, Chicago ... 94
Combined Retail Store and Garage ... 95
Off-Street Parking Block, Oakland ... 95
San Francisco's Underground Garage ... 95
Streamlined Passenger Train with Diesel-Electric Locomotive ... 96
Advanced Design for Express Highway with Street Car and Bus Station ... 97
Cincinnati's Union Station ... 98
Washington Union Station ... 99
Midtown Manhattan, New York ... 100
Downtown Boston ... 100
Providence ... 101

LIST OF ILLUSTRATIONS (Continued)

	Page
Cincinnati	101
Detroit	102
Rockefeller Center, New York	103
Arcaded Street	103
New York Life Insurance Building, New York	104
Department Store Garage, Cincinnati	104
Department Store Garage, Houston	104
Willow Run	105
Bell Telephone Laboratories, Murray Hill, N. J.	105
Ford Motor Company, River Rouge Plant	106
United States Steel Corporation, Gary, Indiana	106
Philadelphia	107
St. Louis	107
Kansas City, Missouri	108
The Boston Wharf Company's Industrial District	108
Port of Oakland, California	110
South Brooklyn Waterfront, New York City	110
Port of Houston, Texas	110
Port of Los Angeles	111
Transferring Rail Freight to Trucks	112
Icing a Refrigerator Car	112
The Platform in a Freight Station	113
Rail Freight Handling — Loading a Freight Car	113
Port of New York Authority Building	113
A Small Airport	114
Oakland Municipal Airport	115
Washington National Airport	115
LaGuardia Airport, New York	116
New York International Airport	116
Airplane Baggage Handling	117
Douglas DC-6	117
Airport Plan for New York Region	118
Airport Plan for Cincinnati Region	118
Helicopter	119
Proposed Los Angeles Civic Center	119
New York's Civic Center	119
Denver's Civic Center	120
Downtown Cleveland and the Civic Center	120
Civic Center at Springfield, Mass.	120
San Francisco's Civic Center	120
Hoover Dam	121
Consolidated Vultee Airplane	123
Boeing C-97	123
The Famous Marble Boat, Peiping	124
Imperial Temple, Peiping	124
Plan of Peiping	124
Typical Mud Hut Colony in China	125
Hauling Merchandise in China	125

LIST OF ILLUSTRATIONS (Continued)

Page

Place de la Concorde, Paris 125
Arc de Triomphe, Paris 126
View of Paris from the Eiffel Tower 126
Place de l'Opéra, Paris 127
Paris — Planned in the Grand Manner 127
The Rue de Rivoli, Paris 127
Plan of Paris 127
L'Enfant's Plan of Washington, D. C. 128
The Capitol and the Mall, Washington 129
London, Showing Pattern of Growth — 1784, 1840, 1900, 1945 129
Wren's Plan for London 130
The Strand, London 130
Piccadilly Circus, London 130
London Traffic Congestion 131
The Greater London Plan of 1947 131
Principal Metropolitan Districts of over 250,000 Population in the United States 132
Multiplicity of Local Government Jurisdictions — Chicago Region 133
Boston Region 134
New York Region 135
The Golden Gate Bridge 137
San Francisco-Oakland Bridge 138
San Diego — Unrelated Subdivisions 142
Section of Zoning Map, Winchester, Mass. 144
Model of Design for League of Nations Headquarters 147
Hudson River and George Washington Bridge 149
The District of Columbia (Air View) 150
The Maine Turnpike 152
Another View of the Maine Turnpike 153
Rockaway Beach, New York 154
The Heart of Boston 156
Bonner's Map of Boston, 1722 158
The Boston Region — Pattern of Communities — 1850 and 1948 159
Development of Regional Highway Network — 1700, 1770, 1800, 1850, 1900, 1948 .. 160
Radial and Circumferential Highways 161
Development of Railroad Network — 1835, 1850, 1900, 1948 162
Rapid Transit Network — 1901 and 1948 163
Boston's Changing Shore Line — 1850, 1900, 1948 164
Dry Land Created by Filling Bays, Coves and Inlets 165
Drake's View of Boston, 1852 166
Greater Boston Reaches out for Its Water Supply — 1850, 1900, 1948 166
Quabbin Reservoir 167
Boston's Sewage Disposal Plan and Sewerage Districts 168
Boston Harbor in 1730 169
Boston Harbor in 1768 169
Building an Aqueduct 170
Topographic Model of Boston Harbor 170
Massachusetts Institute of Technology 171

LIST OF ILLUSTRATIONS (Continued)

Page

Tufts College, Medford ... 172
Northeastern University Campus ... 172
Boston University ... 172
Simmons College, Boston ... 172
Boston College, Newton ... 173
Radcliffe College, Cambridge ... 173
The Harvard School of Business Administration ... 173
Wellesley College Campus ... 173
Population Growth of Boston and Its Metropolitan District ... 174
Boston's Proportion of Metropolitan District Population ... 175
Metropolitan District's Proportion of Massachusetts' Population ... 176
Boston's Population, Analyzed by Country of Birth and by Citizenship ... 177
The Metropolitan Districts' Population, Analyzed by Country of Birth ... 177
More Old People Today ... 178
Fewer Young People Today ... 179
Three-Deckers ... 181
Factory in Residential Area ... 181
Typical Boston Housing (three drawings) ... 182
Typical Boston Housing (three more drawings) ... 183
Blight and Decay (four photographs) ... 184
New Private Housing Development in Newton Center ... 185
John Hancock Village ... 186
Louisburg Square, Beacon Hill ... 187
Play Space in a Public Housing Project ... 187
Areas Suitable for Residential Development — Boston Region ... 188
Old Harbor Village ... 189
Detail of Old Harbor Village ... 189
Proposed Public Housing Project for South Boston ... 190
Charlestown Housing Project ... 191
Traffic Congestion in Boston's Market District ... 192
Existing Major State Highways in the Boston Region ... 193
Highways from the Hub to the West ... 194
The Joint Board's Metropolitan Highway Plan and the Outer Circumferential ... 196
Perspective View of the Recommended Belt Route ... 197
East Boston Express Highway at Logan Airport ... 198
Sumner Tunnel Portal, Boston ... 198
Traffic Jam in Brighton ... 199
Huntington Avenue Underpass at Massachusetts Avenue ... 199
Perspective of the Central Artery through Downtown Boston ... 200
What the Central Artery would Look Like ... 200
New Mystic River Bridge ... 201
Street Blocked by a Heavy Truck ... 202
Post Office Square ... 202
A Parking Garage ... 203
Boston Public Off-Street Parking Locations ... 203
The Streetcars on Boylston Street Went Underground (before and after photographs) ... 205
Metropolitan Transit Authority — Area of Service ... 206

LIST OF ILLUSTRATIONS (Continued)

Page

Removal of Atlantic Avenue El. (before and after) 208
Plan for Extensions of Rapid Transit Routes 209
Washington Street at Cathedral of the Holy Cross (1948 and Soon) 210
An Express Highway Combined with Rapid Transit 211
Diesel-Electric Freight Locomotive 212
Modern Railroad Coach with Novel Observation Deck 212
The Three Major Railroads, Industrial Districts, and Airports 213
Rear View of North Station and the Charles River 214
Boston's North Station 214
Air View of South Station, Fort Point Channel and Business Center 214
Boston's South Station 214
Boston and Maine Railroad Yards in Charlestown 215
The Back Bay 216
Growth of Boston's Port Areas — 1800, 1900, 1948 217
The Port of Boston 218
South Boston Waterfront 219
Boston and Albany Piers 219
Castle Island and the Army Base 219
Site of New Hoosac Terminal, Charlestown 220
Mystic Terminal, Charlestown 221
Modern Gantry Cranes 222
Cargo Handling 222
Loading Grain 223
Cargo Handling 224
Existing Airports in the Boston Region 226
Airport Master Plan for Boston Region 227
Loading Air Freight 228
Logan Airport 230
Merchandise and Mail Delivery by Helicopter 231
New England Telephone and Telegraph Company Building 232
Principal Districts of Downtown Boston 233
The Boston Common and Tremont Street 234
Tower Building 234
Congestion in Dock Square 235
Truck Backing into Off-Street Loading Bay 235
A Motor Truck Interchange Terminal 235
The Park Square Business District 236
New England Mutual Life Insurance Company Building 236
Dedham Center Business District in 1947, and as Replanned 237
Shopping Center Planned for the North Shore 237
A Neighborhood Parking Space 237
Hood Rubber Company, Watertown, Mass. 238
Boston's South Bay District 239
Suggested South Bay Industrial District Development 240
General Motors Company Plant, Framingham, Mass. 241
United Shoe Machinery Plant, Beverly, Mass. 241
Principal Areas Zoned for Business in Boston Region 242

LIST OF ILLUSTRATIONS (Continued)

Page

Principal Areas Zoned for Industry in Boston Region ... 243
The Boston Common and Public Garden ... 244
Franklin Field, Boston ... 244
The Regional Park System — Pattern of Growth — 1850, 1900 and 1948 ... 245
Parks, Parkways and Public Reservations ... 246
The Charles River Basin ... 247
Picnic Grounds in the Blue Hills Reservation ... 247
Hatch Memorial Shell, Esplanade and Embankment Road ... 247
Nantasket Beach ... 247
Middlesex Fells Parkway ... 248
Magazine Beach, Cambridge ... 248
Neighborhoods Need Playgrounds (two photographs) ... 249
Boston City Hall ... 250
Public Works Building, Nashua Street ... 250
New Court House of Suffolk County ... 250
Modern Fire Station in Brookline ... 251
Newton Civic Center ... 251
The Boston Public Library ... 251
Technical High School, Boston ... 252
Brighton High School, Boston ... 252
High School of Commerce, Boston ... 253
Norwood High School, Norwood, Mass. ... 253
The Twelve Original Towns of the Massachusetts Bay Colony ... 255
Map of Boston Boundary Changes ... 256
The Quiet Beauty of a New England Town ... 256
Neighborhoods, and Health and Welfare Districts of Boston ... 257
The "Four Bostons" ... 258
Metropolitan District Commission — Sewerage, Water and Parks Districts (three maps) 260
The Old State House ... 263
The State House ... 264
Bronx-Whitestone Bridge, New York City ... 265
Boston and the Charles River Basin ... 267
New Housing in Waltham ... 269
An Express Highway ... 269
Old Colony Parkway ... 270
Newburyport Turnpike ... 270
Perspective View of the Belt Route ... 271
A Parking Garage ... 271
Tufts College, Medford — Proposed War Memorial ... 272
Radcliffe College, Cambridge — New Dormitory ... 273
The Lamont Library, Harvard ... 274
New Dormitory, Massachusetts Institute of Technology ... 275
Statue of Paul Revere ... 276
Organizing for Civic Action ... 277
Faneuil Hall ... 278
Bunker Hill Monument, Charlestown ... 278
Lexington Green ... 279

INTRODUCTION

Man has explored the earth and, after selecting the best locations, has built settlements in which to live and work. Many of these have grown into vast cities, usually because Nature made them logical centers for commerce. Around these favored cities cluster many smaller cities and towns. Their people have common bonds of cultural and business interests with their neighbors in the big city. All are part of one great community.

In this book we speak of this great community as a "metropolis" or as an "urban region" and the problems that are of mutual concern to its many geographical and political divisions are referred to as "metropolitan" or "regional" problems. When we discuss the big city itself, we use the terms "central city" or "parent city." And when we are concerned solely with the area lying outside the boundaries of the central city, we use the words "environs" or "surrounding cities and towns." It is very important to recognize the essential economic unity of all parts of an urban region. In the sphere of government, the parent city and the surrounding cities and towns are so closely linked together that it has been found necessary to create region-wide agencies to cope with certain governmental problems.

For thousands of years, Man has worked steadily to improve his living conditions, building better cities and applying his inventive genius to ever new fields of endeavor. What changes have taken place even in the last 200 years! Rutted muddy streets have given way to smooth asphalt and concrete. The whale oil lantern carried in the hand of the wayfarer has been replaced by electric street lights. The stagecoach long since yielded to the railroad, which is today supplemented by streamlined buses and mammoth airplanes.

If we visit Paul Revere's home in Boston, we appreciate the contrasts between the standard of living then and now. Progress is an endless moving picture film. We can stop the projector and examine a frame of 1748, of 1848, of 1948 — and see what each has to show us. And then we can start the film again and let it unroll into the future. Much as we may admire the fine silver wrought by Paul Revere and other beautiful handiwork of his time, we would not exchange our times for his. But we must not admire our present surroundings so much that we become loath to exchange them for the better things that the pictures on the Film of Time hold in store for the years to come. To be completely satisfied with what we have is to close our minds and hearts to what can be.

Paul Revere's House . . . . Here lived one of America's greatest patriots. *Fay Foto Service, Inc.*

When you walk around your city or town, try always to think of ways in which it might be changed for the better. Perhaps it was your own great-grandfather, out for just such a walk, who thought how much better the town square would be if it had an ornamental bronze watering trough in in its center. He spoke of this idea to his friends. They talked to the board of selectmen. The new watering trough was installed, and everybody said that it was a wonderful improvement — a splendid example of foresight and enterprise.

That trough is not there now. The picture of 1914 may have been the last to show it. Let the film roll on. What will the young people who read this book have done for the town square by 1988? And what will they still be doing to make the square look even better in the picture of 1998?

Our task is to plan always for the future, and by the inquisitiveness and daring of our thinking, strive to make ourselves and our cities ever equal to their destiny. Daniel Burnham, farsighted architect and master designer of the Plan of Chicago, wrote:

> "Make no little plans. They have no magic to stir men's blood and probably themselves will not be realized. Make big plans. Aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing asserting itself with ever growing insistency."

Planning for the future of a metropolis is very similar to planning one's own life. Young people go through school and study to prepare themselves for their adult years. They marry and find a home for themselves and their children. They seek to make that home as good as they can and to endow it with the highest spiritual qualities.

American Airlines, Inc.

Transportation . . . . Today and Yesterday

Beyond the doors of the home are the streets and parks, schools and churches, stores and offices of their neighborhood. And stretching out in all directions beyond their own neighborhood, are other neighborhoods and towns and cities, knit together by highways and transit lines into one great metropolis — surging with the life of its people.

The neighborhoods, the towns and cities, and the metropolis must all be fashioned to be as good in physical form and as fine in spirit as the individual home and the family it harbors. To achieve that goal is the challenge to Man as he contemplates the metropolis of today.

Let us take stock of the present metropolis. The problems that must be faced vary little from region to region throughout the country. They differ principally in severity and priority of importance. The underlying factors that cause the problems are in all cases (a) congestion, (b) obsolescence, and (c) unguided development.

The Chicago Sky Line . . . . Field Museum and the Aquarium in foreground. The entire waterfront park (Grant Park) is on land reclaimed from the lake. *American Airlines, Inc.*

The ten principal planning problems of city and environs concern the following subjects. They are listed together, so that we can see them as a whole.

1. New Community Growth, including Space for Parks
2. Decayed Residential Areas and the Need for Playgrounds
3. Traffic Congestion
4. Transit and Commuting Railroads
5. Central Business Districts
6. Industrial Districts
7. Port and Rail Freight Facilities
8. Airports
9. Public Buildings and Civic Centers
10. Water Supply and Sewerage Systems

Part I of this book is the story of planning for the metropolis. It traces Man's progress through the centuries in building towns and cities, and describes specifically the growth of five large urban regions in the United States. The ten problems faced by every metropolis are discussed in detail, together with the general solutions that have been found most effective. The latter chapters of Part I are devoted to explaining the legal and financial methods that have proved successful in making and carrying out city and regional plans.

Part II gives an up-to-date account of the particular problems of the Greater Boston region; of the plans that have been made; and of progress toward realization of those plans. The general principles and processes explained in Part I are here applied directly to the Boston metropolis and its emerging master plan.

Concord, Mass. *American Airlines, Inc.*

The problems of the Boston region so closely parallel the general problems of all regions that it is inevitable there should be some overlapping of material and treatment between Part I and Part II. The attempt has been made to keep this to a minimum. It is also true that such problems as traffic, transit and metropolitan government are so interrelated that some repetition is unavoidable.

This book is only an introduction to the field it describes. Regional planning embraces many highly technical subjects: civil engineering, architecture and landscape architecture, economics and sociology, law and the science of government. No attempt is made to deal with them here other than in brief and elementary terms.

Because the future stretches out so far into the realm of the unknown, no plan is ever really finished. There is always more that must be done. The youth of today will grow up to inherit the metropolis and its problems, and will take over the unfinished task and carry it on.

May you who are young be guided in the shaping of your Metropolis by those lines written so many years ago by St. Paul the Apostle:

> "Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, think on these things."[1]

[1] Epistle of St. Paul to the Philippians, Chapter IV, Verse 8.

U.S. Army A. A. F.

Manhattan — Towers, Congestion, Decay . . . . The future is clouded in the smoke of the present.

Part I.
Urban Planning Problems and Solutions

Prehistoric Swiss Lake Village

Cliff Dwellings in New Mexico

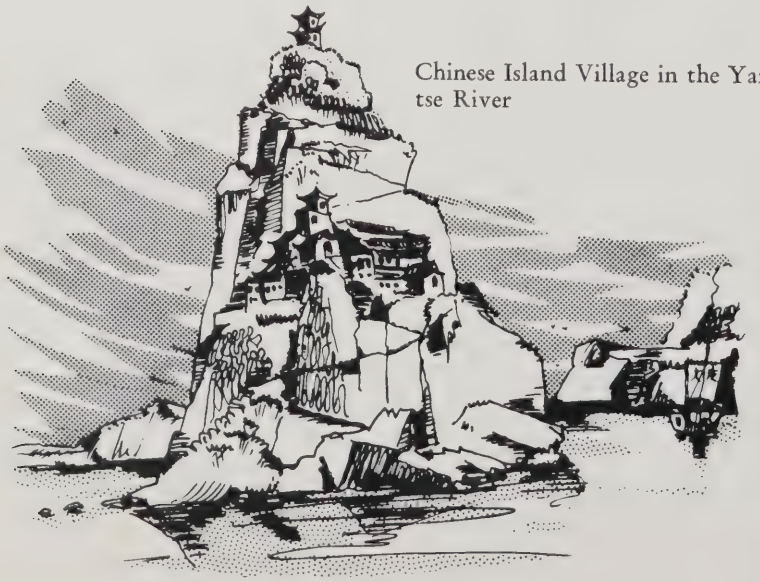
I.

THE EVOLUTION OF CITIES

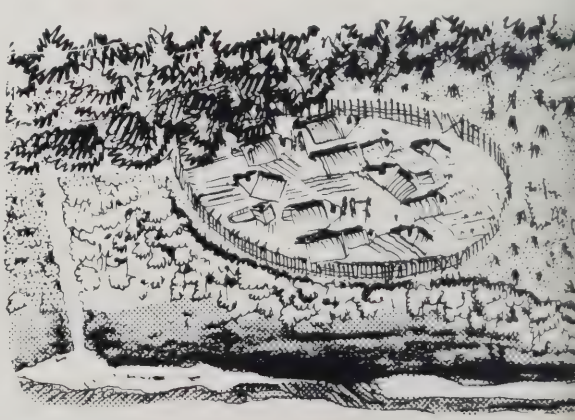
Early Settlements — Formation and Protection

Man's need for protection, first against the elements, later against other men, was the driving force that resulted in the establishment of the earliest towns. Their growth can be traced back, not to the wandering tribes who were content with temporary shelters, but to peasant groups who farmed the land and grouped their huts together in small clusters. Until these tillers of the soil formed themselves into village units, they had no adequate means of protection against the assaults of hostile roving tribes.

Throughout history, another incentive, inherent in man's nature, has also influenced him to seek fixed settlements. This has been his quest for a permanent home, where he can live his life in comfort. Man's attachment to the land becomes closer when he feels secure in the occupancy of a part of it, no matter how small. Accompanying this urge has been his realization that the individual and the social group are closely dependent upon each other. This has been a vital factor in the rise not only of cities and towns but of civilization, which is the product of urban life. The very word civilization is derived from *civis,* the Latin word for city.

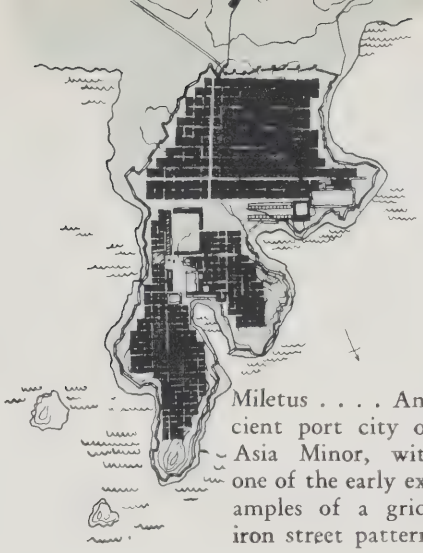


Chinese Island Village in the Yangtse River



Early Fenced Village

The Acropolis of Athens . . . . Imposing buildings on a hilltop site.

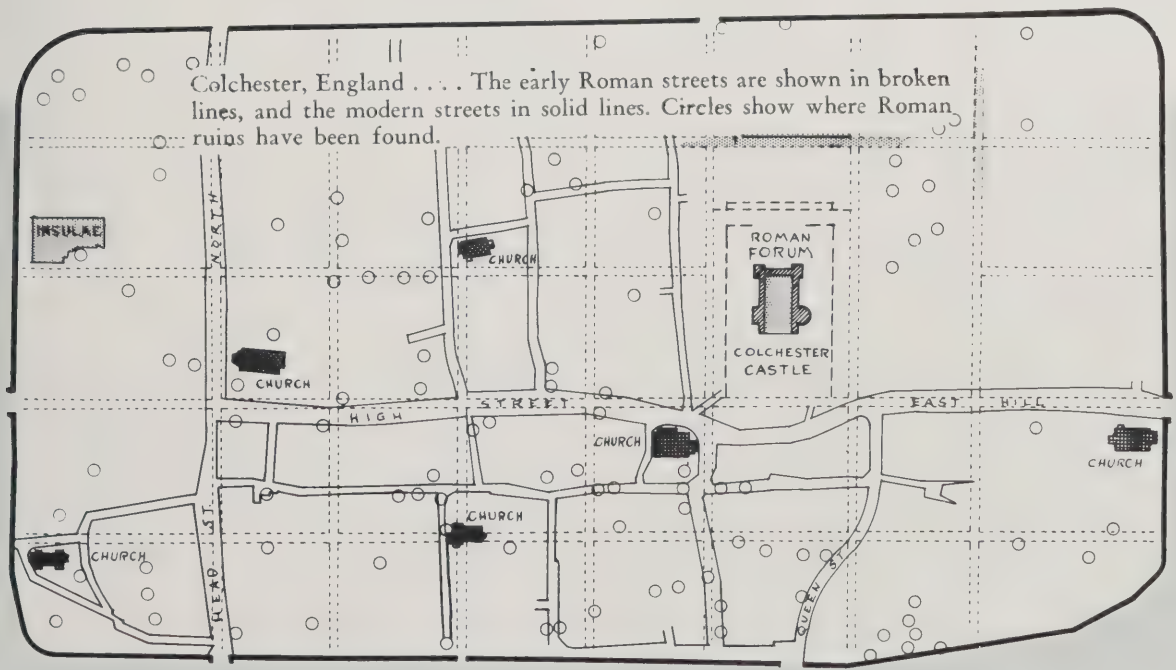


Miletus . . . . Ancient port city of Asia Minor, with one of the early examples of a gridiron street pattern.

Cities of Earliest Times

While the history of the earliest cities is shrouded in legend, their ruins have been excavated and studied and thus provide significant information on their form and growth. Among the very first evidences of permanent communities are the fragments of ancient lake villages in Switzerland, where prehistoric tribes occupied very simple structures resting on timber piles.

Other ancient towns, built on land, depended for protection on artificial barriers — at first timber stockades, and later stone walls and moats. Kahun, in southern Egypt, was a particularly interesting example of the stockaded community. It was built in its entirety about 3000 B.C. to house the slaves who constructed the nearby Illahun Pyramid. Laid out with straight symmetrical streets like so many of our American cities, Kahun is the first known town that was evidently planned in advance of being built. The regularity of its design is in marked contrast to the confused pattern of cities that grew slowly through the years.



Colchester, England . . . . The early Roman streets are shown in broken lines, and the modern streets in solid lines. Circles show where Roman ruins have been found.

U.S. Army A.A.F.

Modern Rome . . . . A combination of planned regularity and haphazard growth.

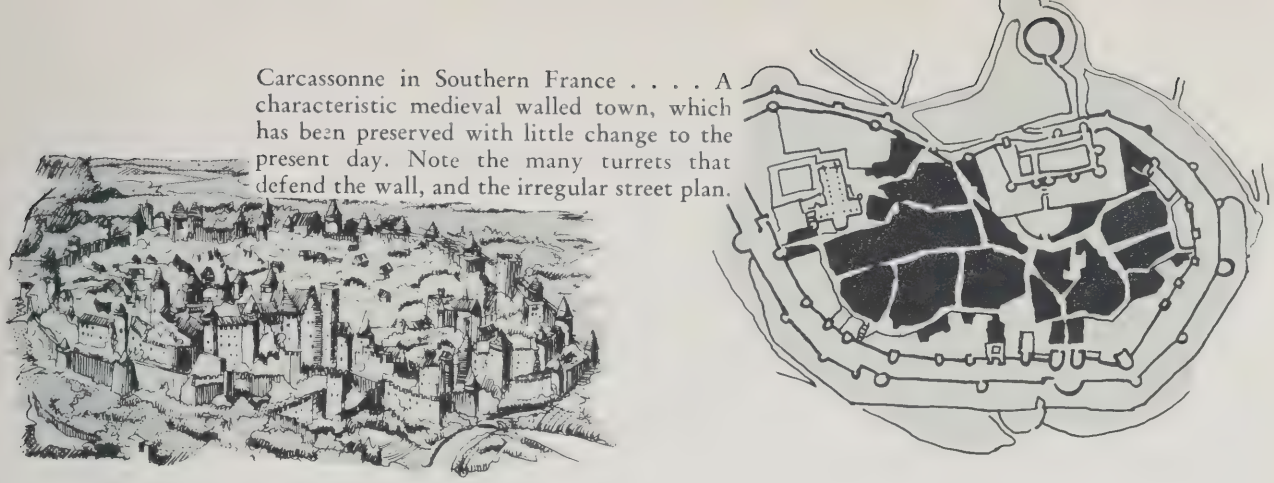
Classic Athens and Rome

The city builders of the Greek and Roman empires produced monuments expressive of their civilization, but did not contribute greatly to the art of planning cities as convenient and comfortable living places for great masses of people. Having first achieved security by constructing strong walls, they expressed their desire for beauty and grandeur by adorning their cities with magnificent public buildings and monuments. The wealth accumulated by conquest and taxation enabled them to build with a lavishness scarcely equalled in history. However, neither Athens nor Rome had the advantage of being developed in accordance with a city plan designed to foresee future growth. Both grew in haphazard fashion around the monuments built in honor of their gods and temporal rulers. Little attention was paid to the need for orderly arrangement of streets and residential areas.

Athens, crowned by the Acropolis with its marble temples, provided an appropriate setting for the Greek culture that flowered most fully in the Age of Pericles. The splendor of the public buildings and gathering places gave fitting architectural expression to the dominant interest in civic affairs so characteristic of Attic civilization. Because of the Greeks' love for athletics and the arts, the stadiums, gymnasiums and theaters were hardly less imposing than the temples. These recreation facilities helped to provide good environment for city living, but could not offset the crowded squalor of the neighborhoods where the multitudes of the poor had their homes.

Philip Gendreau, N.Y.

The Heritage of Ancient Rome . . . . The Arch of Constantine.



Carcassonne in Southern France . . . . A characteristic medieval walled town, which has been preserved with little change to the present day. Note the many turrets that defend the wall, and the irregular street plan.

Borrowing from the Greek tradition, the Romans also sought to express the power of their empire by the glory of their capital city. Considerable areas of Rome were replanned and rebuilt from time to time to provide imposing settings for great public buildings. Colonnaded roads fanned out from the forums around which these buildings were placed. The temples and triumphal arches, the theaters and public baths, the private palaces and country estates reflected not only pride of power but also the Roman rulers' love of luxury, which slowly sapped their strength and contributed to the empire's downfall. Classic Rome, even more than Athens, was a city built by and for the few. Hidden away behind the ostentation of marble columns was a maze of miserable slums where 900,000 people lived in abject poverty.

Medieval Market Towns

With the eclipse of the great centralized power wielded by the Roman empire, western civilization entered the period of history known as the Middle Ages, which lasted until the middle of the 15th Century. During most of this era, town construction was confined to small fortified communities, controlled by local feudal lords. The town wall provided the principal means of protection against enemy attack. Considerations of defense prompted the building of some communities on hills or islands. Others were located on plains or coastal lowlands at the crossing of major routes of commerce where trade opportunities were greatest. A complicated system of walls and moats protected towns that did not have the advantage of natural barriers.

Carcassonne, a medieval fortified town in southern France, still stands today as a reminder of the period when feudal lords were barricading their communities against warlike neighbors. But hundreds of years after the building of Carcassonne, four of the five largest cities in America — New York, Chicago, Detroit and Los Angeles — were founded as fortified villages or military outposts (see illustrations in next chapter).

The protection afforded by medieval fortified towns attracted people from nearby rural areas. With this increase in population, the towns developed rapidly as centers of commerce. The existence of these communities, however, depended upon the maintenance of their food supply. Since the agricultural lands were controlled by different feudal lords, each town faced the ever-present danger of having its food cut off or destroyed by enemy attack. This is one reason why few medieval towns grew to any great size.

Medieval life naturally centered around

Early Saxon Manor, England . . . . The farm families lived in huts clustered near the manor house or castle and cultivated the surrounding open fields.

the market place of these towns. It was there that the products of local industry were exchanged for the farm produce from the nearby fields. The market place also shared in the activities of the adjacent town hall, the church and the guildhalls of the craftsmen. Religious processions usually traversed the market place and ended at the cathedral, which attracted great numbers of the people to its daily services.

Life in the Middle Ages was reflected in the four principal elements of the feudal town: the wall, the market place, the cathedral and the castle. The wall was the bulwark of safety in an insecure world. The market place was the center of trade. The cathedral, with its lofty spires dominating both the town and the countryside, symbolized man's belief in a better life hereafter. The castle represented the military and political power of the feudal lord.

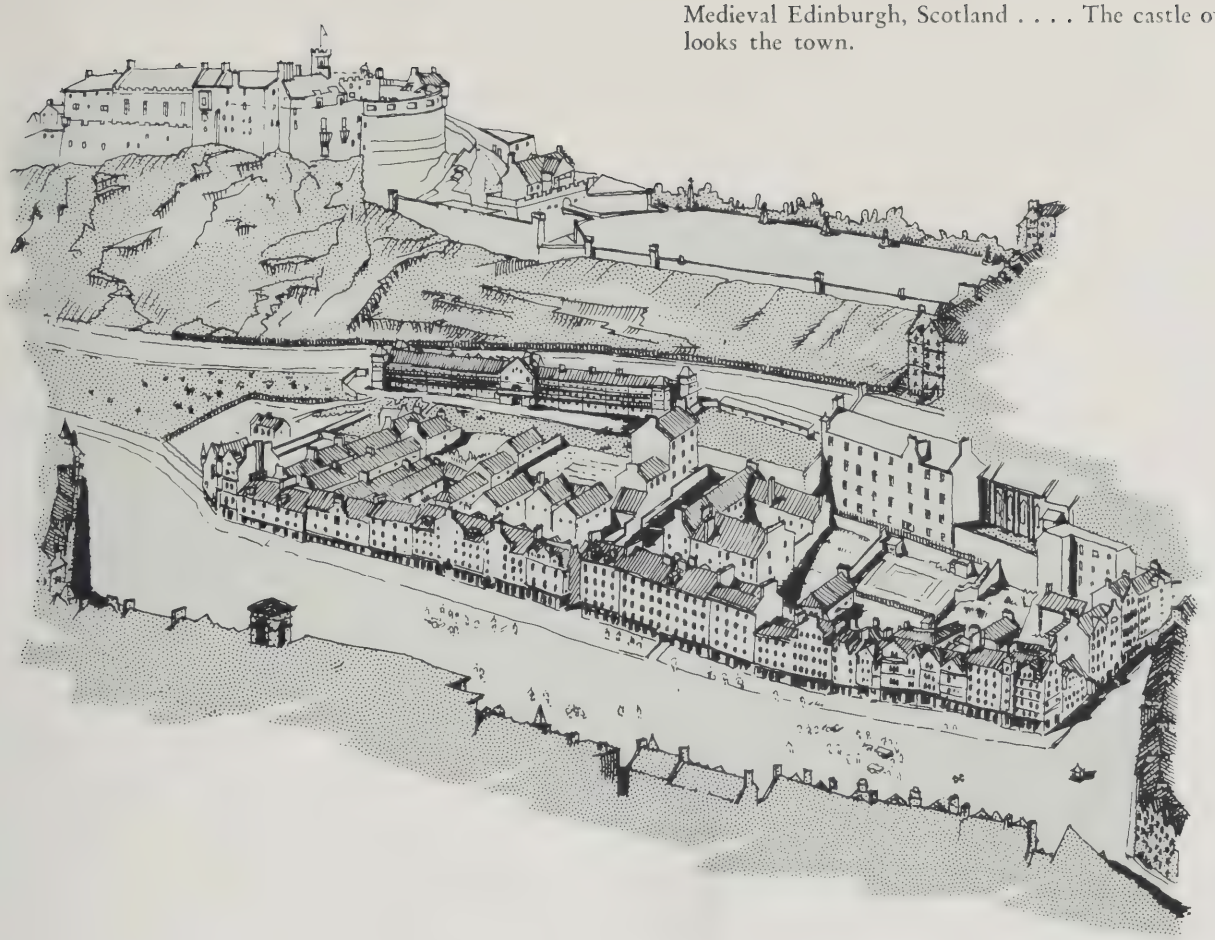
Street Patterns in Medieval Towns

Nothing is more characteristic of the medieval town than its seemingly aimless pattern of winding streets. Sometimes, the direction of these streets was evidently influenced by hills, or was made deliberately twisting to retard penetration of the town by enemy forces that might break through the walls. For the most part, however, the street pattern was the haphazard result of slow unplanned growth, proceeding outward from the center and at the same time inward from the gates of the encircling wall.

The cathedral, the castle, the market

Laxenburg, Germany . . . . An island stronghold of feudalism in the Middle Ages.

Medieval Edinburgh, Scotland . . . . The castle overlooks the town.



square, and the guildhalls were usually built as separate units, each enclosing a central open area. Private dwellings also were constructed in individual groups that formed complete units around inner courtyards. As the number of buildings increased, vacant land gradually disappeared and the town's street pattern evolved as a network of narrow channels of irregular width, consisting of the remaining space between groups of structures. Instead of the streets being laid out first, they comprised whatever land was left after the buildings had been erected.

So crowded did many walled towns become that houses of five and six stories were built, with each story projecting beyond the one below. The top floors of these houses almost touched each other across the narrow alleys that served as streets. Such extreme congestion, plus the lack of a pure water supply and a sewerage system, were responsible for epidemics, which frequently raged unchecked and, at times, virtually depopulated whole towns.

Development of Port Cities

Most of the important ancient and medieval towns were located on navigable water. There were very few highways in those times and transportation of farm produce and manufactured goods was fraught with danger. Even armed caravans were subject to attack by bandits or organized enemy forces. As a result, inland towns lacking

water approaches were restricted in growth by the difficulty of bringing in greater quantities of food and moving out the products of their artisans. By contrast, coastal, lake and river towns had the overwhelming advantage of free and easy access to markets.

Athens, with its nearby port at Piraeus, became a great commercial city; while inland Sparta remained purely military and, when defeated, lost all importance. Tyre and Sidon were thriving coastal cities when their Phoenician galleys ruled the Mediterranean. Carthage, on the shores of North Africa, threatened for a time the power of Rome. In the Middle Ages, Paris and London first

Malines, Belgium . . . . Medieval street pattern, with surrounding wall and moat.

U.S. Army A.A.F.

The Port of New York . . . . The busiest port in the world.

grew to greatness because of the waterways that enabled their commerce to prosper. Later, the Renaissance period saw the rise of Florence and Genoa and Venice in Italy, and such northern European cities as Hamburg, Rotterdam and Antwerp — their wealth based primarily upon the trade of their ports. In modern times, Boston, New York, Buenos Aires and Rio de Janeiro are typical examples of cities that became great because of excellent natural harbors.

Railroad Junction Cities

The development of railroad networks in the 19th Century was a new and powerful force in creating new cities and accelerating the growth of older ones. Because of the opportunities for trade, cities grew up where railways crossed or terminated. No longer were cities without waterways dependent upon highway transportation. Nevertheless, few large cities today are purely rail centers. Even in the United States, where urban growth took place principally during the railroad era, every one of the 15 cities of over 500,000 population has coastal or inland port facilities.

Of course, many of the larger inland cities, of which Chicago is the outstanding example, owe their later growth principally to their railroads, although they are also lake or river ports. In Europe, railroad junctions were generally located in existing urban centers, so that few of the important cities developed originally because of rail traffic.

Philip Gendreau, N.Y.

Rio de Janeiro, Brazil . . . . One of the world's most beautiful harbors. The tall rock, in center, is the famous "Sugar Loaf."

Philip Gendreau, N.Y.

Port of Antwerp, Belgium . . . . Note waterfront dock below the level of boulevard at right.

Keystone View Co., N.Y.

Genoa, Italy . . . . A port that has flourished for 500 years.

Keystone View Co., N.Y.

Venice, Italy . . . . Another Renaissance port city. The tower of St. Mark's dominates the scene.

Wenchow, China . . . . A river and canal port near the east coast.

Hongkong . . . . An island port city off the South China coast. The city and port of Kowloon, on the mainland, lie in the background.

U.S. Army A.A.F.

St. Louis, Missouri . . . . A Mississippi River port and rail center.

The City and Port of New Orleans . . . . 107 miles up the Mississippi River from the Gulf of Mexico. The port has seven miles of waterfront facilities. *Fairchild Aerial Surveys, Inc.*

Industrial Metropolises

The railroad building era and the growth of large scale industry were both made possible by the discovery of steam power. Mass transportation of raw materials and fuel by the railroads accelerated the Industrial Revolution, and the cities with the best locations became great industrial metropolises rather than mere trading centers. The development of commercial electric power, beginning in the 1890's, further hastened the rapid trend of industrial growth.

In 1800, London was the only city in the world with a population as large as one million. Today there are 44 cities with over a million inhabitants. In every instance, trade and industry have been the principal factors in their development.

Even more remarkable is the increase in the number of cities of 100,000 to 1,000,000 population. In 1800, there were only 20 in the world, with none in the United States. Now there are over 500, of which 88 are in this country.

People by the millions swarmed from our rural areas, and from Europe, into American industrial centers. With such phenomenal growth, it is not surprising that city governments failed to plan for the distant future, or even to foresee their requirements for a few years ahead. It is now time to take stock, to correct the shortsightedness of the past, and to plan for the gradual modernization and rejuvenation of our cities, so that by better design and livability they may be equipped to enter a new era of greatness.

II.

THE GROWTH OF FIVE AMERICAN CITIES

The problems of our great American cities can best be appreciated by actually telling the story of the growth of particular cities, and pointing out how they suffered from faulty or insufficient planning for their future expansion. We have chosen New York, Boston, Philadelphia, Chicago and Los Angeles as reasonably typical.

Each city failed to provide adequately for its four basic purposes: places to live; places to work; means of transportation; and facilities for recreation. Errors were made in the layout of streets. Buildings and people were too closely crowded together. Most of the mistakes were the result of rapid, unforeseen and uncontrolled growth. They were intensified by such technological advances as steam power, railroads, electricity and automobiles.

NEW YORK CITY

Founding of New York — Fortified Trading Town

The Dutch settled New Amsterdam on Manhattan Island in 1624. The early colony was a typical fortified town, protected by Fort Amsterdam which dominated the community scene with its chapel, governor's house, barracks and prison. Security against the Indians was afforded on the north by the town wall at what is now Wall Street, while the Hudson and East Rivers protected the flanks of the settlement. The Costello Plan, illustrated here, shows New York as it was in 1660 when its population had reached 1000.

The colony grew extremely slowly. In fact, during the 100 years from 1660 to 1760, the town's population increased to

New York, about 1626 . . . . This first-known sketch shows the tip of Manhattan Island and the original Dutch fort.

New York — Costello Plan of 1660 . . . . Wall Street runs along the right-hand side of the drawing.

only 14,000. By 1800, however, New York had recovered from the crushing effects of British occupation during the Revolutionary War and had outstripped Boston and Philadelphia to become the leading seaport in the Western Hemisphere.

Major Transport Center

The years from 1800 to 1860 witnessed New York's amazing growth from a small city of 80,000 to an urban region of more than a million people. The city's ever increasing prosperity was largely due to its ideal location. It was able to tap the rich resources of the interior first by way of the Hudson River, then by the Erie Canal and the Great Lakes, and later by a network of railroad routes.

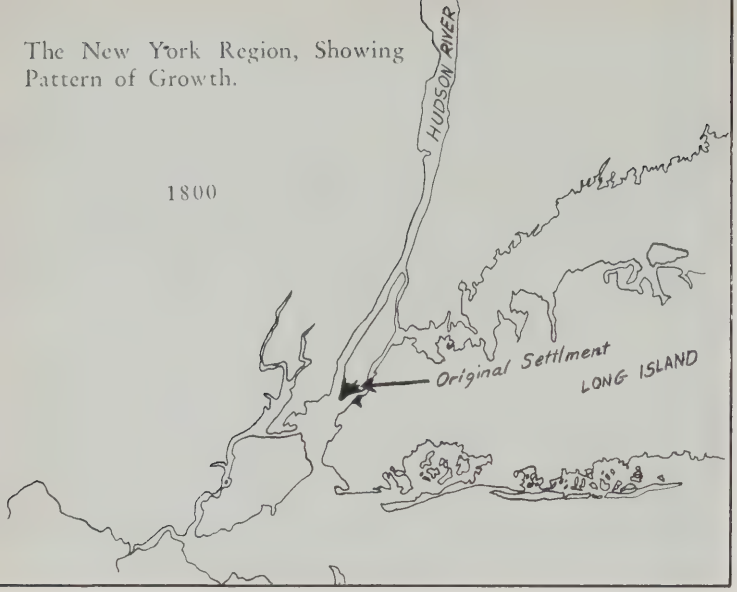
New York's First City Plan

As early as 1807, the New York State Legislature created a commission to lay out the undeveloped areas of Manhattan Island. The commission drew up the so-called "Plan of 1811" fixing the lines of avenues and streets as far north as what is now 155th Street. Because of its rigid rectangular pattern, this plan was ill-adapted to Manhattan's hilly and rugged terrain. The plan included only one diagonal artery (Broadway) although many more were needed. Once the plan was adopted, it remained substantially unchanged despite new factors that demanded revisions. For example, the plan provided many east-west streets because it was thought that most of the traffic would be between the East River and the Hudson River. The few north-south avenues, however, have progressively increased in importance and have long since become completely inadequate for their heavy streams of traffic.

Expanding City

During the last 40 years of the 19th Century, Manhattan Island's population grew from 813,000 to 1,850,000 with ever-mounting congestion. These were the years when the flood tide of immigration from Europe ran strong and full.

The New York Skyline, as Seen from Brooklyn.



The New York Region, Showing Pattern of Growth.

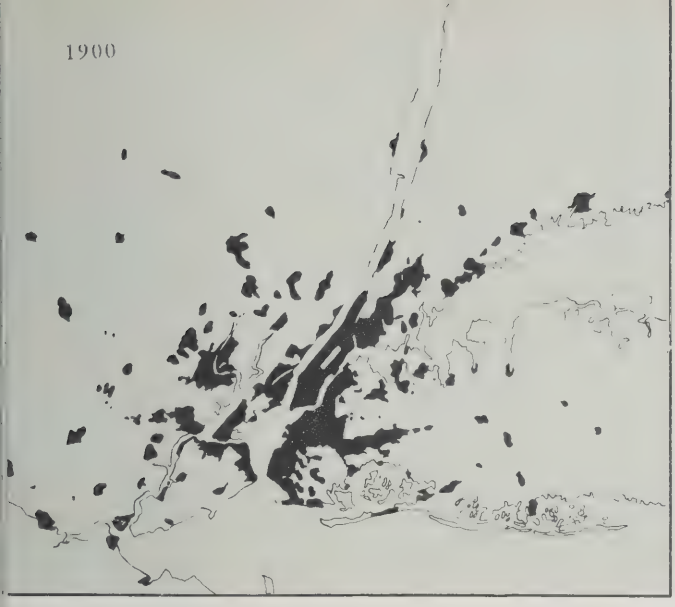
The advent of new transit lines made lower Manhattan more and more accessible to the thousands pouring into the city. In 1871 the first elevated railway line, operated by steam locomotives, was constructed from the Battery at the southern tip of Manhattan as far north as 31st Street. This line was later electrified and extended northward to the Harlem River. Elevated routes were built on Second and Third Avenues, with one line continuing into the Bronx. Many transit lines from Brooklyn also converged on Manhattan, via the Brooklyn Bridge.

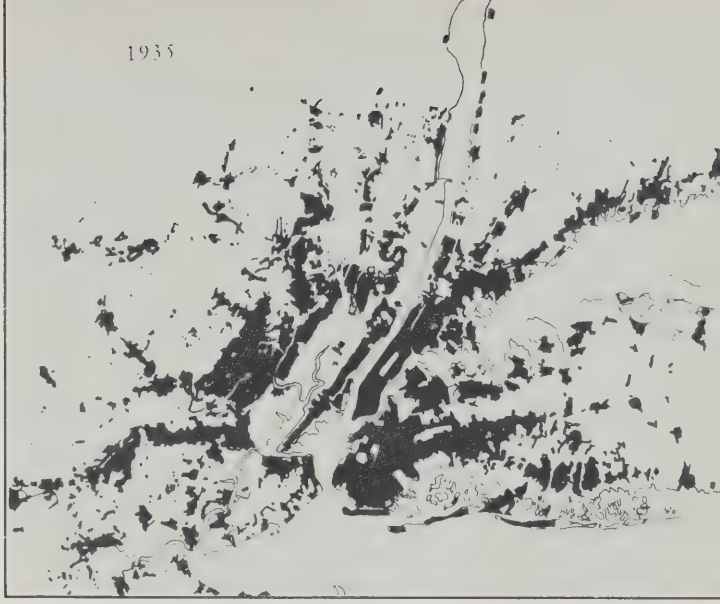
Civic and administrative leaders realized that the government of the vast area dominated by Manhattan should be consolidated into one municipality. In 1898 the Greater New York Charter became effective and separate village and town governments in Brooklyn, Queens and Richmond were abolished and their responsibilities taken over by one municipal government for the greater City of New York. (The Bronx had been annexed to New York in 1895.)

Metropolis and Region

Population: In 1900, Manhattan housed almost 54 per cent of the people in the whole

The Commissioners' Plan of New York, 1811 . . . . The built-up area is shown in black.





Manhattan Island Today . . . . Looking north across the financial district. *Fairchild Aerial Surveys, Inc.*

city, and more than one-third of all those in the region.[1] By 1940, both percentages were more than cut in half by decentralization and new growth in outlying areas. Manhattan passed its population peak shortly after 1910 and lost 20 per cent (464,000) of its residents between that year and 1930. In the succeeding decade, it regained about 33,000. In 1940, New York City's population (five boroughs) was 7,455,000 and the region had grown to 12,308,000. The corresponding estimated figures for 1947 were roughly 7,835,000 and 12,684,000.

Rapid Transit: The framework of New York's rapid transit lines has determined the spreading pattern of population to a greater extent than in any other city. Dense apartment house construction followed the new lines with the result that about 85 per cent of New York's people live within one-half mile of a transit station, with easy access to the central business districts of Manhattan. It is significant that these 6,650,000 people are jammed into one-third of the total city area. No more forceful example could be given of residential congestion produced by rapid transit routes.

[1] The New York Region is defined by the Regional Planning Association, Inc. to embrace the five boroughs or counties of the City of New York, five other whole counties and parts of two more in New York State, eight whole counties and part of one other in New Jersey, and part of one Connecticut county.

American Airlines Inc.

George Washington Bridge . . . . Built by the Port of New York Authority, this bridge connects upper Manhattan with New Jersey. The span between towers is 3500 feet.

Parkways and Express Highways: The New York region has pioneered in the construction of parkways and express highways. Its Bronx River Parkway was the first of a great chain of passenger automobile express parkways. Two of the most notable accomplishments in New York City proper have been the construction of the elevated West Side express highway and Henry Hudson parkway along the Hudson River, and the East Side expressway on the East River shore of Manhattan (see photographs on page 89). These two waterfront arteries were the first projects to contribute materially to relieving north-south traffic streams since the original avenues were laid out in 1811.

Bridges and Tunnels: During the past 25 years New York has been continuously at work on the problem of vehicular river crossings. Some of the recent great tunnels and bridges have been built by the Port of New York Authority, a joint agency of the states of New York and New Jersey. These include the Lincoln Tunnel, George Washington Bridge, and three bridges connecting Staten Island with New Jersey. Several others, entirely within New York City, are the work of Park Commissioner Robert Moses, who also serves as chairman of the Triborough Bridge and Tunnel Authority.

Parks and Playgrounds: Like other cities, New York had some large parks and many quiet park-like squares, but all too few athletic fields and playgrounds for its youth. From 1930 to 1947, the park and parkway acreage in the five boroughs was increased from 10,307 acres to over 22,000 acres, largely as the result of the leadership of Commissioner Moses.

Housing: New York has built its residential districts to accommodate too many people on too little land. As a result, we find miles of ancient tenements, usually four

or five stories high, in congested areas of Manhattan, Brooklyn and the Bronx. Less central areas frequently have six-story non-fire-proof elevator apartments, covering most of their lots and leaving only narrow courts and yards for light and ventilation. In the 1920's and 1930's, however, new patterns of building design, with far less congestion, began to emerge. Notable among these are the groups of so-called "garden apartments" with large private open spaces between and around the buildings.

Regional Plan of New York and Its Environs

In 1921, the Committee on Regional Plan of New York and Its Environs, a privately financed organization, proceeded to make a comprehensive series of surveys and plans for the entire region. Its reports, published at intervals from 1927 through 1931, had great influence upon subsequent design and construction of public improvements, not only in and near New York but in urban regions throughout the country.

New York City Planning Commission

By popular referendum the City of New York adopted a completely new charter, which became effective in 1938. Among other important new provisions, the charter established for the first time an official City Planning Commission. No other local planning agency in the United States has such extensive authority as this New York commission.

Looking Toward The Future

New York's progress in planning and construction shows an official awareness of the city's problems and a determination to solve them. The city and its environs are working toward the goal of a balanced program of reasonably adequate transit and highway systems. New population growth is taking place to an increasing extent in the outskirts of the city and beyond where ample space for living can be more readily secured. A beginning has also been made on the very difficult problem of rebuilding centrally located blighted areas.

The forthright accomplishments of the city government and the well coordinated work of state and local governments throughout the region are an inspiration to other municipalities whose problems, though equally serious, are of lesser magnitude.

Triborough Bridge and Tunnel Authority

Henry Hudson Bridge . . . . This double-deck structure joins The Bronx with Manhattan and is a link in the Henry Hudson Parkway.

New York City Dept. of Parks

Jones Beach, Long Island . . . . Largest public beach in the world. Note the huge automobile parking areas.

Hales Map of the Boston Region, 1819

BOSTON

Early Settlement — Growth of the Port

Boston was founded in 1630 by Governor John Winthrop and a small group of Puritans. Served by an excellent harbor, the town soon became the leading port of colonial America, a distinction it kept for many years. The shrewd aggressiveness of Boston's shipowners and merchants was a major factor in the development not only of the Boston region but of Massachusetts and, in fact, of all New England.

The Golden Age of the Port of Boston was during the 1840's and 1850's when Donald MacKay built his clipper ships on the East Boston waterfront. Such vessels became famous in the China trade, racing to bring valued cargoes of tea, spices and other products of the Orient to the expanding Boston market. During this period, Samuel Cunard established steamship service between Boston and Liverpool. In 1841, the Western Railroad was opened between Boston and Albany, thus aiding the growth of the port.

Development of Industries

Enemy sea blockades during the War of 1812 and the Civil War diverted many of Boston's great fortunes from shipping to manufacturing. Between 1840 and 1880 thousands of immigrants poured ashore to provide needed labor for the region's mills and factories. Since then, Boston's industrial growth has been rapid and today it is one of the principal industrial regions of the nation.

Boston's First Municipal Building . . . . The Town House of 1657. On this site now stands the Old State House.

Regional Railroad Center

The rapid development of the railroad helped transform Boston from a market town to a bustling metropolis. Within the short space of 15 years (1835-50), seven railroads entered the city and Boston soon became the hub of New England's railway system. The impact of the railroads on the city was two-fold. They made Boston the dominant commercial and transportation center of New England. They also enabled thousands of people to live in the suburbs and work in Boston, creating a full-fledged metropolitan region.

American Airlines, Inc.

The Old Boston Waterfront and the Business Center.

Geological Museum, Harvard University

Topographic Model of Boston Region . . . . This model brings out the hilly terrain of Greater Boston, and shows highways and railroads following the valleys. You are looking toward downtown Boston (see arrow) from Swampscott. The middle foreground has since been filled in to construct Logan Airport.

Land Reclamation

Boston provides a unique chapter in the history of city development in the United States. Originally settled on a tiny peninsula, the city multiplied its land area by filling in its tidal flats and waterfront coves. No other city in the world has reclaimed as much land from surrounding marshes and shallow harbor waters.

Street Pattern

The street pattern of downtown Boston has changed little in the past three centuries. The early houses were located to meet the needs — or fancy — of the inhabitants. The connecting streets followed the easiest curves of the hills and the original shore line of the rivers and harbor. They are narrow and crooked, and are directly responsible for Boston's chaotic traffic congestion.

In sharp contrast to the disorder of the central city is the radial pattern of outlying roads, and particularly the turnpikes built early in the 19th century. Though not equal to the needs of modern traffic, they furnish the essential framework for the regional highway system of the future. The circumferential routes, originally constructed to connect adjoining towns with no thought of a continuous circuit around the region, are also inadequate for present-day automobile travel.

City Planning in Boston

Boston is usually thought of as a city that grew without any semblance of a plan, because its haphazard street pattern contrasts with the regular gridiron layout characteristic of most large American cities. The city, however, must be credited with many examples of sound planning and foresight, even though they involved only isolated projects. For example, Boston Common, one of the city's most famous landmarks, was set aside more than 300 years ago as a public tract for pasturing cows. The main area of the Common has been carefully protected through the years from commercial encroachment. Another example of careful advance planning was the filling in and development of the Back Bay area, creating the Public Garden and Commonwealth Avenue, one of America's finest streets.

No official planning agency, however, was established in Boston until 1891 when the Board of Survey was appointed to draw up a street plan for the entire city. The following year, the State Legislature passed what may be claimed to be the first zoning law in the United States. This law imposed a city-wide height limitation of 125 feet

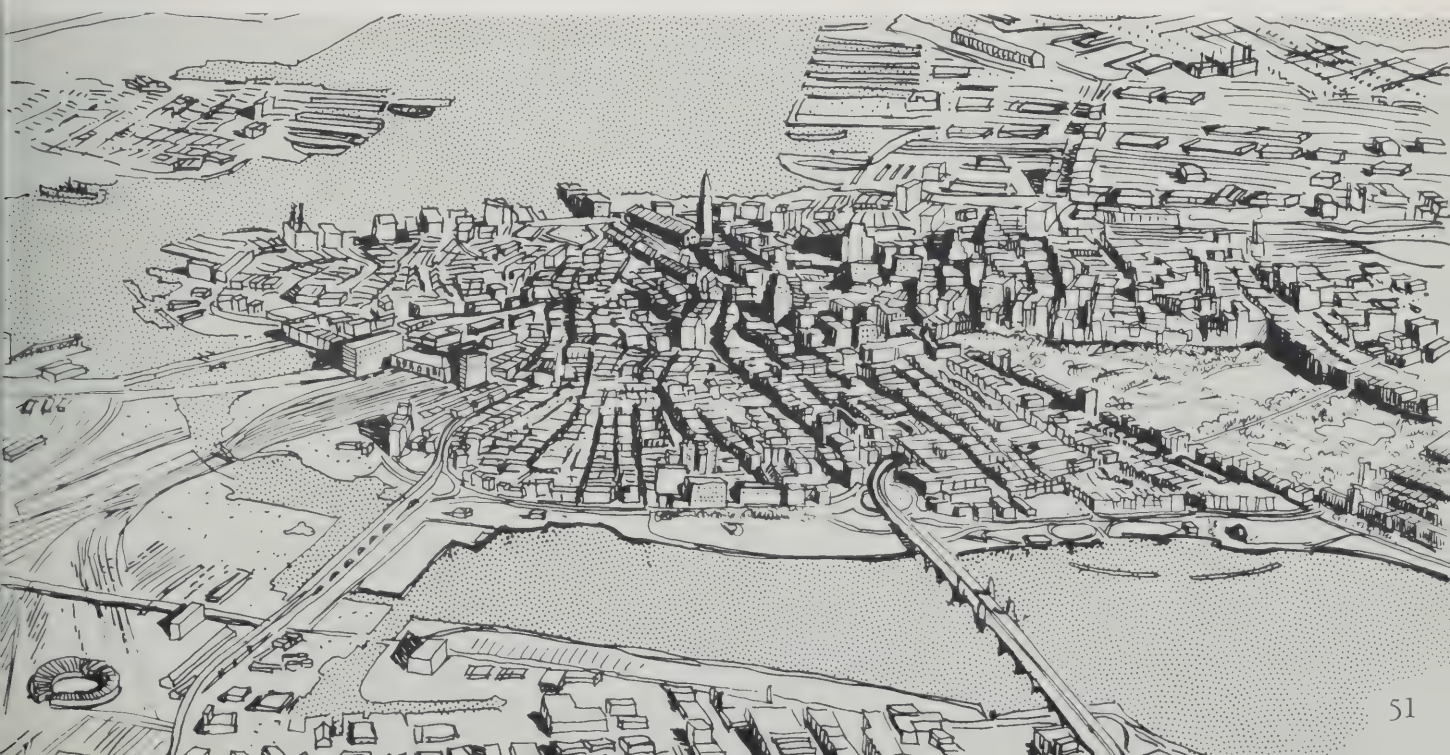
Boston's Commonwealth Avenue . . . . In the foreground is the Massachusetts Avenue overpass. *Ewing Galloway, N.Y.*

The Boston Public Garden. . . The famous "swan" boats are a popular attraction. *Ewing Galloway, N.Y.*

for all buildings. It was adopted because tall apartment houses had been erected on Beacon Hill, overshadowing neighboring properties.

In 1914 the Planning Board of the City of Boston was created. Ralph Adams Cram, the famous architect, became chairman. Among the major accomplishments of the board have been the securing of authorization for numerous street widenings; the preparation of a comprehensive zoning plan, adopted in 1924; the publication of an official map of the city in 1926; and the completion in 1930 of a "Report on a Thoroughfare Plan for the City of Boston" under the direction of the late Robert Whitten, eminent city planning consultant.

wntown Boston Today . . . . Sketched from the Cambridge shore.



Metropolitan Planning

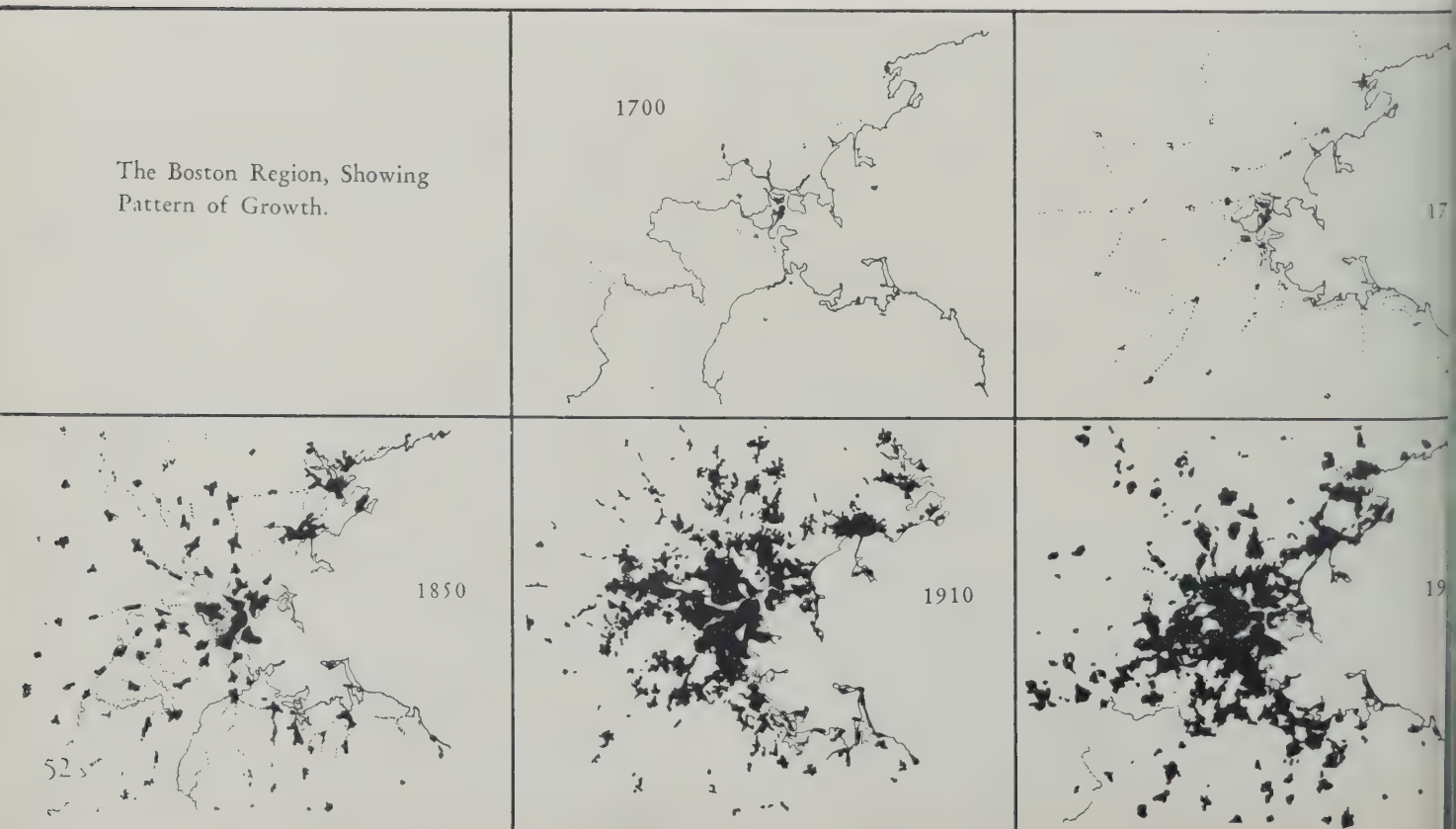
The Boston metropolitan region spread so extensively between 1850 and 1910 that the central city and its nearer suburbs blended into a solid physical unit. As the population increased, many problems became regional in scope. Parks, water, and sewer systems, major highways, and transit facilities could no longer be provided by each individual city or town.

The State Legislature created a series of agencies to cope with some of these problems on a regional basis. A water commission began the task of giving the Boston region one of the finest water supply systems in the country. A metropolitan park commission was appointed to develop a system of parks and parkways. Today the Metropolitan District Commission is in charge of park, water and sewerage systems that together embrace 43 cities and towns. Planning functions for the State and its separate metropolitan regions are the responsibility of the State Planning Board.

Present Problems

Among the most difficult planning problems faced today by the Greater Boston region are traffic and transit congestion, the housing shortage, and lack of small parks and playgrounds to serve the people of crowded areas. The city also contains many decayed residential neighborhoods, which are a challenge to large-scale rebuilding operations. There is a parallel need for modern industrial development to replace obsolete manufacturing plants.

In the field of government, it would be desirable to achieve a greater degree of unification of agencies that administer regional services for the more than 2,000,000 people who live in the 43 separate cities and towns of the Boston metropolitan district.

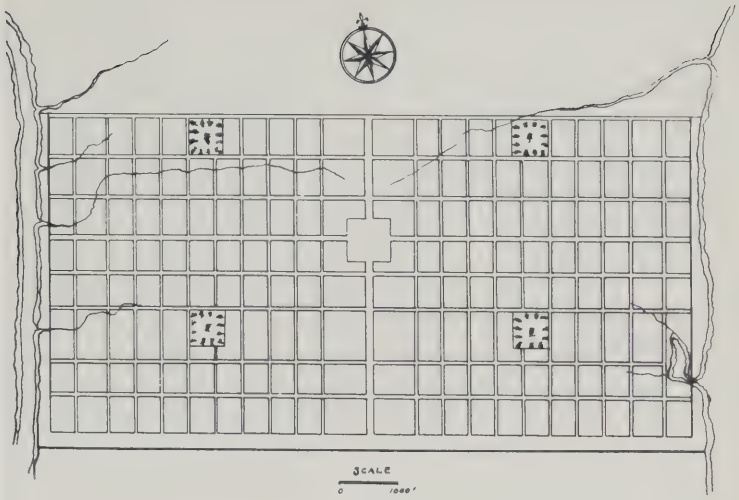


The Boston Region, Showing Pattern of Growth.

PHILADELPHIA

Early Settlement

Philadelphia was established by William Penn in 1682, more than 50 years after the founding of the other two leading colonial cities, New York and Boston. An important factor influencing the founding and development of Philadelphia was the peace and safety afforded by the region. The city, unlike Boston and New York, began as an unfortified town because the Indians were friendly.



William Penn's Plan of Philadelphia, 1683 . . . . The first gridiron street layout of a large American city. Many of the blocks have since been divided by narrow streets. The squares are the five original parks.

Penn's Famous Plan

The Plan of the City of Philadelphia, prepared for Penn in 1683 by Thomas Holme, was the first master plan drawn up for a large American city. With its rectangular blocks extending uniformly between the Delaware and Schuylkill rivers, it was the first of the typical gridiron plans adopted by hundreds of cities and towns in the United States. Except for some modifications, this design is still the street pattern of central Philadelphia today.

The original plan covered an area of only two square miles — eight blocks wide and 22 blocks long. Subsequent extensions of the plan to include many times this area produced in Philadelphia a hodge-podge of unrelated rectangular patterns. Downtown Philadelphia today has only one important radial thoroughfare, the Benjamin Franklin Parkway, running northwestward from the center of the city. This was cut through the street pattern at great expense between 1910 and 1920 and has become one of the famous streets of the world (see illustration).

Benjamin Franklin Parkway . . . . Looking from the Art Museum in foreground toward the City Hall tower.

The Philadelphia Region, Showing Pattern of Growth.

Penn's plan was remarkably foresighted for the times in that it provided five large squares or parks. The central one later became the City Hall site. Unfortunately, the city did not build additional squares as the gridiron design was extended. The two principal thoroughfares, Broad and Market Streets, intersect at Center Square. These two streets were made intentionally wide, 113 feet and 100 feet respectively, to accommodate the traffic which their central location invited. All other streets were uniformly laid out only 50 feet wide. Later, many blocks were bisected by even narrower streets, resulting in building congestion and ultimate neighborhood decay.

For orderliness and simplicity of pattern, the Philadelphia Plan as originally drawn could hardly have been improved upon in meeting the needs of the early city. However, this rectangular system of narrow streets falls far short of coping with present day traffic problems.

Market Town

Situated on the Delaware River, which is navigable for 135 miles, Philadelphia soon became a major outlet for furs and agricultural products. By 1760, it had a population of 19,000, and had outstripped both Boston and New York to become the largest city in colonial America — a position it held until nearly 1800. Easy access to unlimited supplies of coal and iron ore later gave tremendous impetus to new industries.

Major Transport Center

The rapid expansion of commerce and population, together with the problem of moving troops swiftly during the Revolutionary War, emphasized the need of adequate land transportation. Between 1790 and 1820 many private firms undertook the construction of radial turnpikes or toll roads connecting Philadelphia with surrounding communities.

The Philadelphia-Lancaster Turnpike, begun in 1792, was the first of its type in America. This highway was 70 miles long and cut a 40-foot swath through dense forests. Its financial success stimulated construction of similar turnpikes between Philadelphia and key cities and towns in the region. The framework of the system was gradually extended to include well-defined routes connecting Philadelphia, Trenton, Camden, Chester, and Wilmington, with minor radials from these centers to smaller communities. These highways, with the aid of subsequent improvements, are reasonably

Independence Hall — Cradle of Liberty . . . . The area above and to the right of center is planned for clearance and partial rebuilding, with much increase of open space. *American Airlines, Inc.*

The Philadelphia Metropolitan Region . . . . Built-up areas show in dark tones. *U.S. Army A.A.F.*

adequate for today's inter-city traffic requirements. The present need in the Philadelphia environs is primarily for circumferential routes to connect the radial highways in outlying districts.

In 1834, the State of Pennsylvania completed a complex system of canals, portages and rail links extending from Philadelphia to Pittsburgh. The canals gave Philadelphia the advantage of cheap water transportation. The rail links of the system later served as the nucleus of the Pennsylvania Railroad network.

Metropolis — Consolidation of Communities

By 1850 the problems and pains of Philadelphia's metropolitan growth had become acute. Its population had spread far beyond the boundaries of Penn's original city. In 1854, by act of the State Legislature, Philadelphia was made co-extensive with the county of Philadelphia, an area of 130 square miles. Today it is the third most important manufacturing city in the nation and center of the third largest urban region. The population of the city in 1947 was about 2,100,000 and that of the region nearly 3,375,000.

Long-Range Planning

Philadelphia, like all American cities hamstrung by congestion, needs a complete system of express highways within the city limits. Removal of the so-called "Chinese Wall" of railroad tracks on Market Street will permit the construction of a new and impressive highway and the redevelopment of a large decayed area. The need for rebuilding blighted areas is obvious — 15 per cent, or about 80,000 of the dwelling units in Philadelphia, are substandard. Obsolete industrial areas also must be redeveloped. Fully 25 per cent of Philadelphia's 35 square miles of industrial districts suffer from congestion, smoke, odors, haphazard intermixture with residences, and inadequate space for expansion.

In 1932, the Regional Planning Federation of the Tri-State Metropolitan Area, a private organization, published a comprehensive plan for the city and surrounding municipalities. Unfortunately, few of its recommendations were carried out because of the depression.

Not until 1942 did Philadelphia establish an official City Planning Commission. This commission has recommended a six-year program of improvements for 1948-1953, estimated to cost $302,000,000. The pro-

Philadelphia in 1702 . . . . Shows early port development on the Delaware River. Note that the community extends only a few blocks into the area laid out by William Penn.

gram includes highways and bridges, transit, recreation areas, airports, water supply and sewerage systems. The commission works closely with authorities in adjacent municipalities and has coordinated its efforts with those of the Commonwealth.

Present Day Philadelphia . . . . Benjamin Franklin Parkway runs from the center of the city diagonally up the photograph to the left. Schuylkill River at left. Delaware River and Philadelphia-Camden Bridge at right.

Fort Dearborn in 1820 . . . . A fortified outpost that was destined to become the great metropolis of Chicago.

CHICAGO

City of Rapid Growth

The history of Chicago is a story of spectacular growth. Founded in 1803 as a military outpost at the mouth of the Chicago River, this small settlement became the second largest city in the western hemisphere within the short space of 100 years. Because of its ideal geographical location, it was predestined to be the industrial capital and the inland transportation center of a region embracing all the states in the great central basin of the continent.

Chicago grew slowly at first. Its population was only 2,000 in 1834. After 60 years, however, the former military garrison had become a giant metropolis of more than a million people. In 1947 Chicago's population was estimated at 3,725,000 and that of the region at 5,206,000.

Early Street Plan

While it cannot be said that Chicago expanded without benefit of a street plan, it is nevertheless true that the city suffered from the very rigidity of that plan. Each square mile of the city was divided into four quarter sections, each containing 32 identical blocks bounded by streets 66 feet wide. The uniformity of the pattern, once considered a great American contribution to city design, actually made every street a thoroughfare for high-speed traffic. Better planning would have established a network of wide major arteries, with narrower minor streets.

Market Town

Chicago early developed as a retail trade center, attracting wagon caravans from as far as 200 miles distant. The town's commerce at first depended entirely on the lake port and the primitive roads that radiated from the settlement along early Indian trails. These roads were surfaced with planks to cope with the heavy mud. Some of them, such as Milwaukee, Madison, and Ogden Avenues, influenced the developement of residential and business structures in a radial pattern extending from the business center to the suburban areas, just as in a later period numerous towns and villages grew up along the main radial railroad lines. These plank roads provided a system of diagonals, which relieve the inflexibility of the rectangular street pattern that today covers more than 250 square miles of the Chicago region. They serve as part of the framework for a modern express highway plan.

The commerce of Chicago was greatly increased by the Illinois and Michigan Canal, which opened up vast new territories by connecting the city with the Illinois River, a tributary of the Mississippi.

Railroad and Manufacturing City

Construction of the Galena and Chicago Union Railroad, begun in 1848, heralded a

new era in the growth of Chicago. This project was soon followed by a large number of other rail lines. Today the city is the junction point for 38 railways.

The many railroads converging on the downtown district have had a detrimental effect on the residential areas of Chicago. Their freight yards, originally on the edges of town, have been enveloped by the spreading city so that they are now far too close to its center. The railroad viaducts have also cut the city area into a haphazard pattern, isolating many small neighborhoods from schools, stores and recreational facilities.

The railroads not only brought tens of thousands of new people to Chicago, but also transported raw materials for its growing industries and delivered their finished products to the rapidly expanding agricultural districts in the Mississippi Valley. By the close of the Civil War, Chicago had become one of the country's great manufacturing centers, producing principally iron and steel, farm implements, machinery, and meat products.

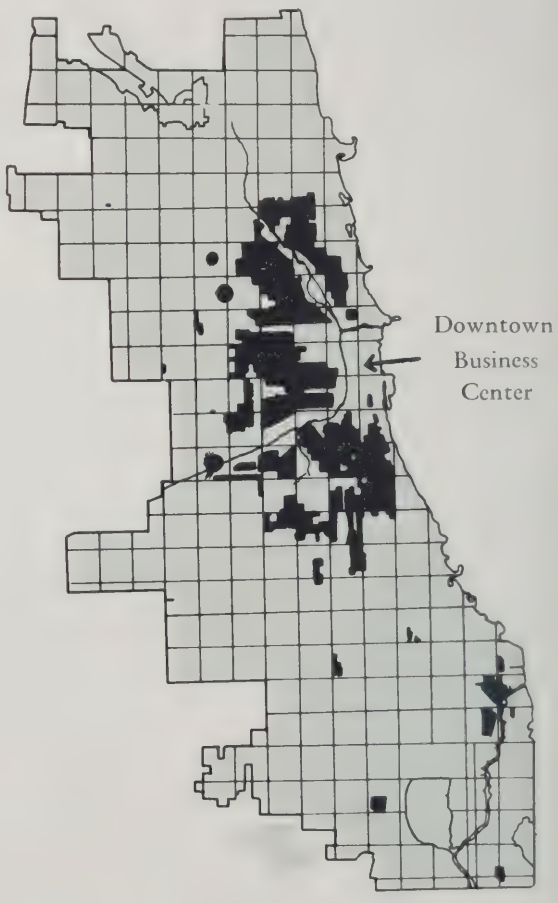
Pattern of Development

Hemmed in on the east by Lake Michigan, Chicago surged over the original city boundaries to the north, south and west. This expansion was roughly star shaped, following the radial highways and railroads. Independent settlements on the outskirts were consolidated with the city. Chicago's internal transportation system grew to meet increased demands, and beginning in 1890, electric trolleys replaced the old horse-cars.

Chicago Fire

In 1871 Chicago suffered its disastrous fire, which destroyed most of the central district. Reconstruction unfortunately adhered to the old narrow street pattern with its few diagonal highways.

A considerable portion of Chicago's poorly designed and congested residential areas were untouched by the fire. The new dwellings that were built in the devastated districts were not much better than the old. There has been little large-scale rebuilding in the years since the fire. As a result, Chicago today has over nine square miles of badly blighted residential areas, housing 375,000 people — more than a tenth of the city's population (see map).



Chicago's Blighted Residential Areas . . . . These areas have been recommended by the Chicago Plan Commission for clearance and redevelopment. The main streets on the plan are one mile apart. Note that the downtown business center is almost surrounded by blighted areas.

Downtown Chicago at Night

American Airlines, Inc.

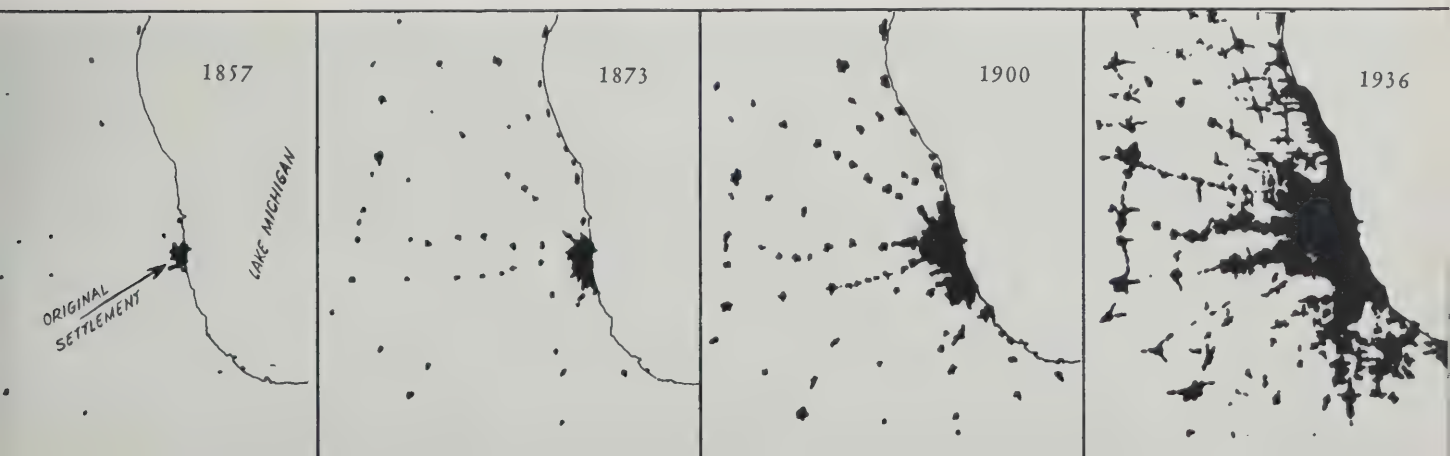
The World's Fair and City Planning

Little attention was paid to the principles of city planning before 1865, but in that year the influence of Baron Haussmann's work in rebuilding Paris began to be felt. The result was the creation of an extensive system of parks and connecting boulevards, partially encircling the city.

The Chicago World's Fair of 1893 gave great inspiration to the city planning movement in America. The monumental design and grouping of its buildings afforded millions of visitors from all parts of the country a vision of beauty that was a refreshing relief from the crowded ugliness of the typical American city. A wave of enthusiasm swept the nation and classic groups of public buildings in many cities today owe their origin to the fair.

The impact on Chicago itself was great. Local architects and businessmen urged the application of the fair's principles of design to their own city. Daniel Burnham, one of the architects for the fair, completed a plan for Chicago in 1909. The development of Chicago's beautiful lakefront park was the principal achievement of this plan, but its emphasis on long-range foresight has continued to influence Chicago's thinking through the years. The Burnham Plan remains a milestone in the history of the city.

The Chicago Region, Showing Pattern of Growth.



Regional Planning

With the coming of the Automobile Age, the construction of a good highway system became important not only to Chicago itself but to the vast area beyond the city's limits. As a result, state, county and city highway departments improved and coordinated the antiquated highway pattern. Such agencies as regional park, water and sanitation districts were created to cope with other metropolitan problems. Much of the stimulation for these activities has come from the far-sighted efforts of the Chicago Regional Planning Association, an unofficial body organized in 1923.

Chicago Plan Commission

Chicago has had an official Plan Commission since 1909, the year the Burnham Plan was completed. The commission, as reorganized in 1939, has published a valuable series of survey reports on population, neighborhood characteristics, land use, housing and rebuilding problems, and industrial and commercial trends. In collaboration with other agencies, it has already completed many significant parts of a comprehensive master plan for the city. The Master Plan of Residential Land Use was issued in 1943; the Proposed Expressway Development Program in 1944; a long-range coordinated program of public improvements in 1945; and a map showing the Preliminary Comprehensive City Plan in 1946. Supplementing the effective work of the Chicago Housing Authority, the commission has proposed a program to correct overcrowded and obsolete housing conditions. It is also giving its attention to rapid transit, railroad and airport improvements.

American Airlines, Inc.

Michigan Avenue . . . One of the world's most famous business streets.

Chicago in 1853 . . . . A fast growing city, with its street pattern already laid out far beyond the built-up area.

Fort Dearborn in 1830 . . . . The Chicago River runs up the sketch from Lake Michigan. The present downtown district is to the left of the river.

Fairchild Aerial Surveys, Inc.

Chicago's Lake Michigan Waterfront . . . . Municipal Pier in right foreground. Outer Drive — an express parkway — shows along the lake front. Much land has been reclaimed from the lake to provide parks, parking space and railroad yards.

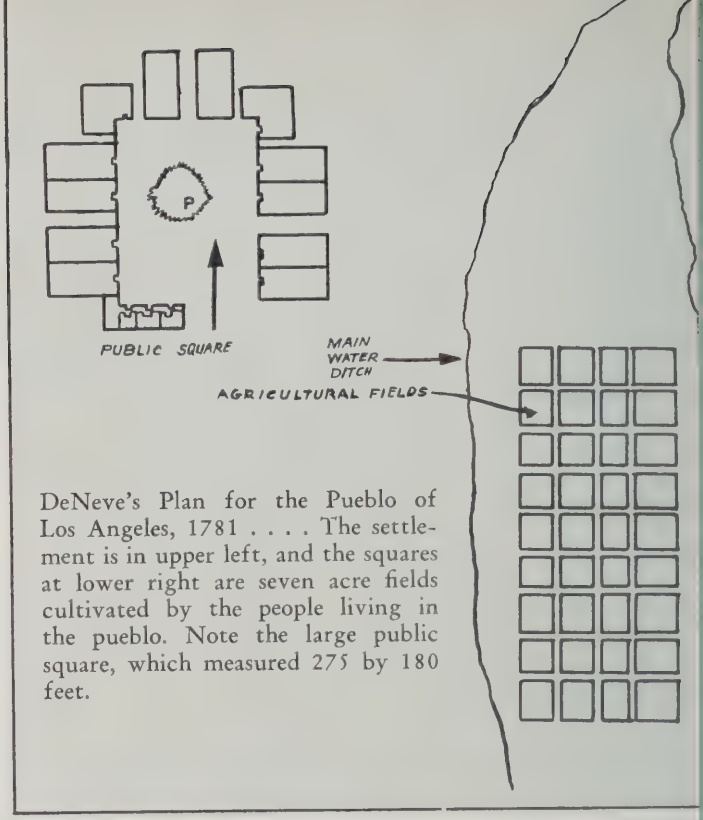
LOS ANGELES

Early Spanish Settlement — De Neve's Plan

Los Angeles, often called the "newest great city in the world," has actually been in existence for more than 150 years. It was founded in 1781 by Philip De Neve, Governor of the Spanish Province of California.

De Neve drew up an intelligent and carefully conceived village plan for the new settlement, with public buildings and residences grouped around a central plaza. Although all traces of it have long since disappeared, this early plaza was not far from the present Los Angeles civic center. De Neve stipulated how every parcel of land in the village was to be used. He gave each family a field to till and equal rights in communal grazing lands.

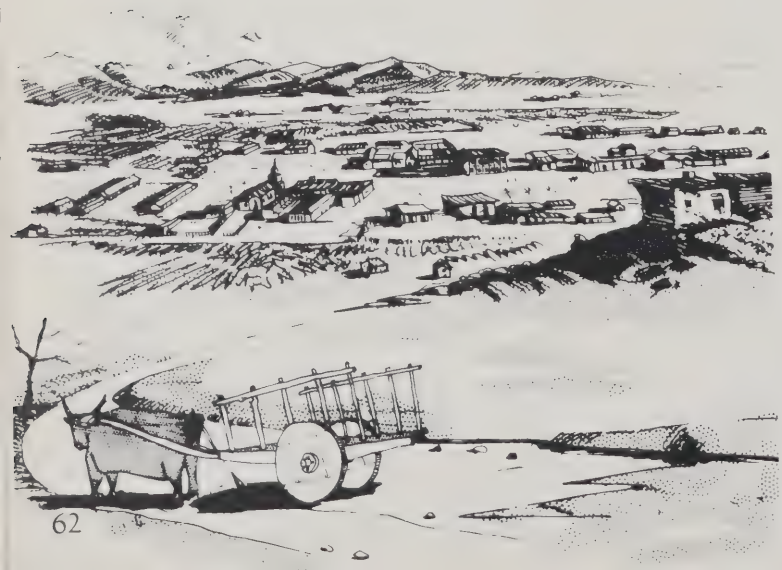
The town later became Mexican territory. In 1846, when it surrendered to the American forces, its population was barely 1500. Twenty-five years later it had increased to only 5000.



DeNeve's Plan for the Pueblo of Los Angeles, 1781 . . . . The settlement is in upper left, and the squares at lower right are seven acre fields cultivated by the people living in the pueblo. Note the large public square, which measured 275 by 180 feet.

Market Town

Los Angeles remained basically a local trading center for an isolated agricultural community until 1876 when the Southern Pacific Railroad reached the town from San Francisco. Los Angeles then began to ship its oranges and other semi-tropical fruits to the East. Suddenly newspapers throughout the country started to hail the southern California region as the "Modern Garden of Eden." This publicity greatly stimulated the rapid growth that transformed Los Angeles in a very few years from a sleepy town to a bustling, expanding city.



Los Angeles in 1853 . . . . The total population was then less than 2000.

Major Transport Center

The completion of the Santa Fe Railroad line to Los Angeles in 1885 marked the beginning of one of the most bitter rate wars in the nation's history. Passenger fares on the Santa Fe and the Southern Pacific were cut repeatedly until the fare from Kansas City to Los Angeles dropped to a single dollar. But the railroads' loss was the

city's gain. A thousand immigrants from the East poured in each month and real estate values boomed. Los Angeles' population multiplied five times between 1880 and 1890, reaching the then amazing total of 50,000.

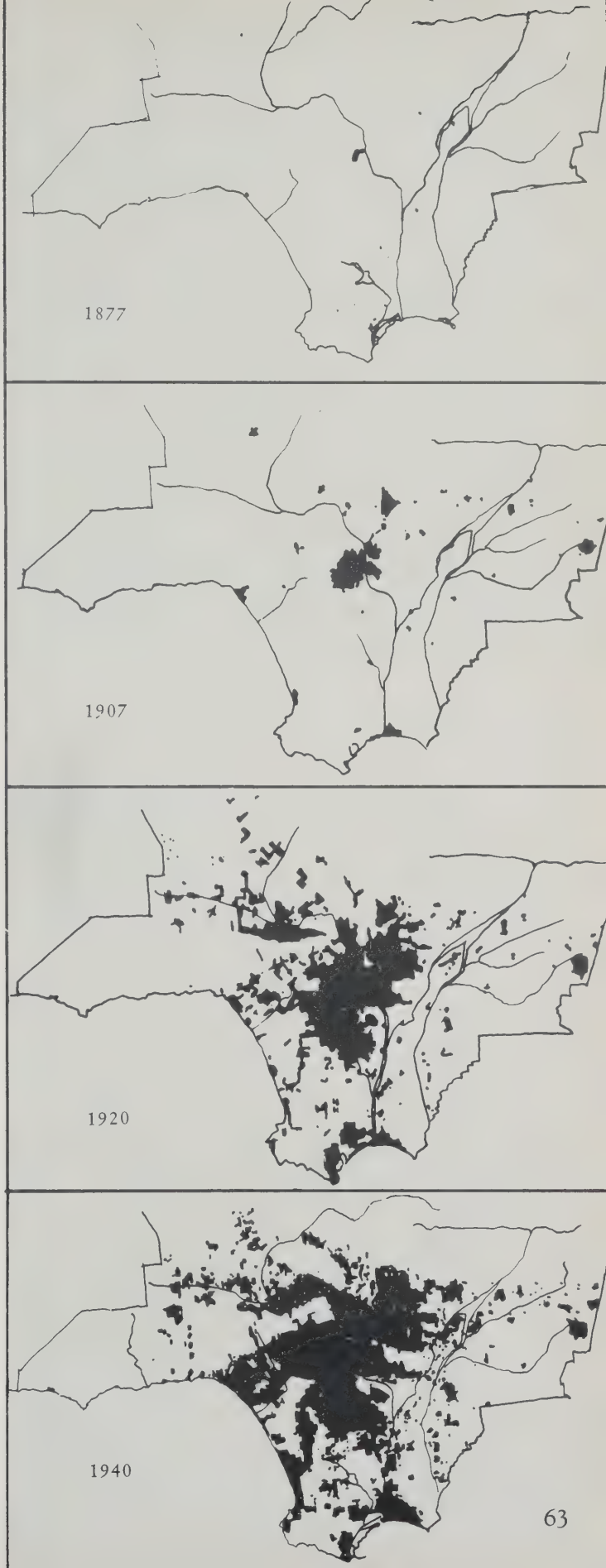
Land speculators, taking full advantage of their opportunities, were responsible for much of the reckless subdivision development of this period. They secured control of flourishing orchards and vineyards and cut them up into small lots "facing narrow streets running checkerboard fashion up and down hill, across gulches and over impassable rock piles."[1] Vast areas of level land also were exploited and the city spread wildly in all directions.

Transit

The construction of an electric railroad from Los Angeles to Pasadena began the development of the largest interurban electric railway system in the world. By 1916 there were more than 1000 miles of electric railways radiating from Los Angeles. These lines had tremendous effect in aiding the growth of the region.

Water Supply

The extension of the city's water supply system also was a decisive factor in accelerating the growth of Los Angeles. Because of early droughts, the residents were deeply conscious of their dependence on a man-made water supply. In 1907 the city voted to spend $23,000,000 to build the Los Angeles-Owens River Aqueduct to carry water from the High Sierra Mountains, 250 miles away. This aqueduct, completed in



The Los Angeles Region — Showing Pattern of Growth.

[1] La Reina — Los Angeles in Three Centuries, by Laurance L. Hill, page 77.

U.S. Army A.A.F.

The Los Angeles Region . . . . This air view gives an idea of the vast expanse of the city. The Sierra Madre Mountains are in the background.

1913, brought water to the San Fernando Valley where it was stored in great reservoirs for use in the 300 square mile area covered by Los Angeles and its surrounding towns. This water supply turned an arid region of grazing lands into a busy metropolitan area that includes such prosperous places as Hollywood, San Pedro, and Wilmington.

Parker Dam, a still greater project, was constructed on the Colorado River (downstream from the mighty Hoover Dam) and in 1941 a 242-mile aqueduct was completed, bringing added water to the towns of the Los Angeles Metropolitan Water District and irrigating the Imperial Valley. This vast water supply and the electric power generated at the dam contributed greatly to the geographical expansion of Los Angeles, as many outlying towns became part of the city so that they might enjoy the advantages of the project.

The Metropolis

Los Angeles experienced its greatest speculative land boom in the years following World War I. Fourteen thousand subdivisions containing 143,000 lots were offered for sale in a brief two year period (1922-23). Their street patterns were disconnected and usually bore scant relation to existing street systems. Many of these subdivisions were far from the center of the city and could be reached only by private automobile. Even today some of these subdivisions lack public transportation.

The status of the Los Angeles central business district remained uncertain as long as the tremendous growth of the city was unguided by any definite plan for development. Zoning restrictions gradually limited commercial activities to certain well-established sections. The creation of a new civic

American Airlines, Inc.

A Section of Downtown Los Angeles . . . . The buildings of the Civic Center dominate this area.

center in downtown Los Angeles also helped anchor the principal business area. Decentralization has nevertheless continued, with outlying business districts multiplying to serve new residential developments. Their retail trade has grown faster than in comparable districts of any other American metropolis.

The population of the City of Los Angeles in 1947 was in excess of 1,805,000. There were an additional 1,100,000 people in the environs beyond the city limits, making an aggregate of nearly 3,000,000 — almost equal to the combined total for the six states of Arizona, Idaho, Montana, New Mexico, Utah and Wyoming. The Los Angeles region is fourth in population rank in the United States.

The City of Los Angeles spreads over an immense area of 459 square miles. Its average density of population is less than in most large cities of the world, with many extensive districts still sparsely settled. Single-family houses predominate. The lack of residential congestion permits the people to enjoy greater contact with nature than is usual in crowded American cities.

City and County Planning

Recognition of the dangers of continued haphazard growth beyond the city limits led to the creation in 1922 of the Los Angeles County Planning Commission. Two years later, the City Planning Commission secured the adoption of a major street traffic plan for Los Angeles. A master regional plan for Los Angeles County was approved in 1941. Many additional planning studies, city and regional, have since been completed.

III.
RESIDENTIAL PROBLEMS

NEW COMMUNITY GROWTH AND ITS GUIDANCE

Decentralization

We have reviewed the growth of urban living from the earliest times to the present and have shown specifically in the case of five American cities how their development has been influenced by such factors as topography, access to raw materials, inadequate street systems, transportation facilities and land speculation.

One striking fact has stood out in our study of these cities and that has been the progressive decentralization of population. As central areas have become increasingly crowded and unattractive, there has been a compelling urge to escape and live in the suburbs. This movement has only been made possible by the extension of rail and rapid transit lines and the widespread use of automobiles by commuters.

Census figures for the principal metropolitan regions of the United States show the force of this trend. From 1920 to 1930, suburban areas increased 39.2 per cent in population while the central cities increased only 19.4 per cent. From 1930 to 1940, suburban population expanded 16.9 per cent as against a mere 6.1 per cent for the central cities. By 1940 the metropolitan environs had grown to include almost one-third of the total population of urban regions.[1]

The objective in residential building in new suburban areas that have previously been open country is to avoid repeating old designs and old mistakes. New developments will last for generations. When they are first built, they should therefore represent the very best of modern knowledge and skill, and be protected against future damaging influences. Specifically, what are the mistakes to avoid?

Past Mistakes

The first mistake is overcrowding the land, allowing too little space for the individual family. Overcrowding spells congestion. The "new" areas of 50 years ago — and, unhap-

[1] Percentages based on U.S. Census figures. Comparable data not available in 1920 and 1940 for identical lists of urban regions.

American Airlines

Gridiron Street System . . . . Every street is a potential traffic thoroughfare.

pily, of 20 years ago — are badly congested. The private houses are too close together; the lots are too small; and the apartment buildings are so tightly wedged against each other that their rooms lack light and air. Congested areas do not retain their attractiveness and value. Families move away when they can afford to do so. Other families move in, not because they wish to, but because they can afford nothing better. As this process continues, the properties decay, passing successively down the economic ladder. Overcrowding of the land thus breeds the slums of tomorrow.

A good home is a requisite for a happy life. It is a prime objective in planning for the future. Every new home, whether it be a private house or an apartment, should be sufficiently large. The arrangement of rooms should assure a degree of privacy for all members of the family. Plenty of fresh air and sunshine are essential. Bathrooms and central heat must be provided — they are part of our American standard of living and are no longer luxuries. There should be ample yard space outside the home for children to play; or in the case of apartment houses, ample play lots on the property for joint use of all the youngsters. It is certainly shortsighted to overcrowd the land so that the only place for little children to play is in the streets or in distant public playgrounds.

The second fundamental mistake is the jumbling together of different kinds of buildings, with shops sandwiched between private homes, apartments invading one-family neighborhoods, and noisy and objectionable industries close to residences and stores. That was the way things happened in the days of early city growth. It still happens sometimes, for lack of community guidance.

Overcrowding the Land.

Boston Housing Authority

Jumbled Land Uses . . . . A factory in a residential area.

Boston Housing Authority

Little Air and Sunshine.

The third mistake is monotony of layout, typified by the gridiron pattern, with its long straight streets cutting the land into almost identical rectangles. This system turns every street into a traffic thoroughfare,

Premature Subdivisions . . . . Disjointed and mis- matched street systems.

U.S. Army A.A.

so that children are in danger whenever they step off the sidewalk. The gridiron plan also ignores the special problems of design created by hills and valleys. More imaginative planning would make the most of every variation in topography by fitting the street pattern to the contour of the land. Long straight streets have their place in the master plan, but only as major arteries of travel, not as the inner framework of residential neighborhoods.

The fourth mistake is the cutting up of vast areas of land into streets and building lots far in excess of the actual demand for home sites. This is called "premature land subdivision." Such real estate practice exploits the desire of hundreds of thousands of persons to escape the congestion in the hearts of our cities. In the past, many persons have purchased lots, not with the intent of building homes, but merely in the expectation of unloading the property at a quick profit. These hopes were usually unrealized. Unable to sell, and unwilling to pay accumulated land taxes, the owners generally abandoned their lots. In the meantime, however, suburban communities borrowed millions of dollars to pay for such improvements as streets, sidewalks, and water mains in various subdivisions. Authorities could not collect taxes from the abandoned property, with the result that the cost of these ill-advised improvements fell on established residences and other income producing property.

The full implications of this metropolitan problem become clear by citing an actual example. In the Detroit region there are vacant subdivided lots sufficient to accommodate an additional 3,000,000 people! The Detroit City Planning Commission has estimated a maximum regional population increase of not over 600,000. The obvious conclusion is that there will never be any need for existing vacant lots for the other 2,400,000 people. This is waste land — a no man's land blighted by the vain hope of

building development. Such land generally cannot be used again for farming because it has been intersected by streets, cut up into small pieces, and burdened with the legal problems of multiple ownership and unpaid taxes. The moral of premature land subdivision at least is clear: It must not happen again!

The fifth mistake is failure to acquire land for small public parks and playgrounds, and adequate school sites and athletic fields before new building development takes place. We know that many of the older sections of large cities are woefully lacking in this respect. Yet, all too often, new communities take form without providing these obviously necessary components of good environment.

These then are the main mistakes of past community building. How may we guard against their repetition? What are the proven solutions?

General Solutions

To prevent overcrowding the land, municipalities adopt zoning ordinances, which regulate the size of lots and density of population. The principles and methods of zoning are part of the legal framework of planning, which is treated in considerable detail in Chapter X. If overcrowding of the land is prevented, it then is possible for architects and builders to erect homes with plenty of light and air and other features for good living.

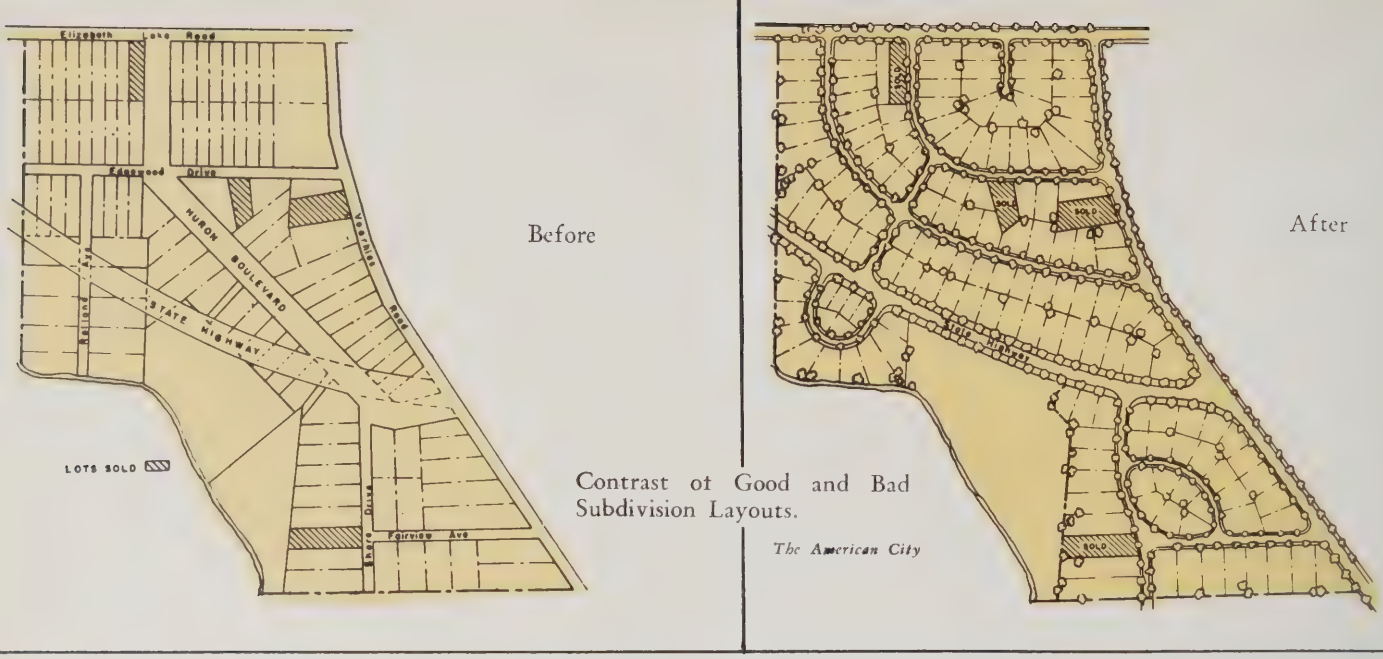
The jumbling of residential, business and industrial land uses should be prevented in advance by zoning. The time to plan for the right things in the right places is when new streets are first laid out on vacant land. This is not merely a job of earmarking certain areas for apartments, some for shops, and others for manufacturing, but actually involves the whole design of the street system and the community. Such design will in itself avoid the third and fourth mistakes — monotonous street layouts and premature subdivisions.

Laying out parks and playgrounds in new developments is a function of the planning board, to be exercised when it passes upon subdivision plans. Many state laws expressly provide that the board may require that appropriate areas be set aside for parks, which must be deeded to the municipality as one of the prerequisites for official approval of the plans.

Boston Housing Authority

For Want of a Playground.

Boston Housing Authority



Contrast of Good and Bad Subdivision Layouts.

The American City

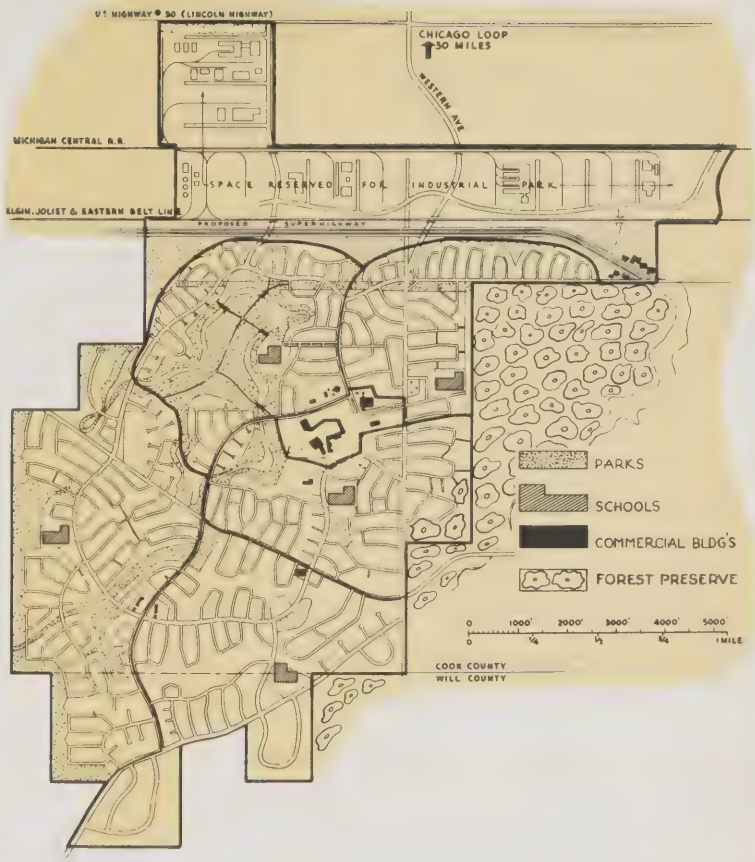
It becomes clear from the above discussion that the five principal mistakes of earlier neighborhood and community design can all be overcome in new layouts by the combination of zoning and subdivision controls. However, these regulatory measures need to be accompanied by sincere determination on the part of the land developer himself to do the very best job that he can. With the land developer and planning board working harmoniously together, far more will be achieved than the minimum requirements set up by ordinances and regulations.

Model Town Near Chicago

Subdivisions are generally very limited in area. To secure a well coordinated pattern of facilities for living, shopping, work and recreation, it is highly desirable to design, finance and construct whole new communities. The most outstanding recent American example is the layout of an entire town of 2,500 acres by a private organization, American Community Builders, Inc. It is situated 30 miles south of the Chicago business district. This huge project will eventually house 8,000 families in five contiguous neighborhoods, each with its own elementary school. Ample sites have been reserved in advance for stores, community buildings, libraries, churches, parks and play areas. Land has also been set aside for industrial development, so that the town will be a reasonably self-contained economic unit rather than just another suburban dormitory. Examination of the illustration will reveal the attention that has been given to planning the street system for safety, so as to reduce traffic hazards to an absolute minimum. It will be noted that most of the minor streets are loops or cul-de-sacs (dead ends), with through traffic concentrated on the relatively few major streets.

Earlier model towns have been laid out both in America and abroad. Because of their beneficial influence upon modern city planning, it is worth while to be familiar with the more exemplary communities that have been designed and built to conform with modern standards and modern needs.

New Town near Chicago . . . . The town comprises five adjoining neighborhoods. Planned industrial district at top of sketch. Note major street system focusing on shopping center. The minor roads are of no use for through traffic as they are designed to serve only residential property.



Chicago Plan Commission

Good Residential Layout . . . . Express highway at left. Shopping center, top left. School, bottom right. Through traffic is discouraged by the irregular pattern of the residential streets.

Letchworth and Welwyn

The first of the sucessful new towns was Letchworth, in England, about 28 miles north of London. The entire town was laid out in detail before construction was started in the early 1900's. It was the work of Ebenezer Howard, an American who organized a private company to build the town. He combined inspired vision with enthusiasm and practical business sense.

Letchworth is a "garden city" surrounded by a belt of open space reserved for agriculture, forest and park use. It has grown steadily and now numbers about 20,000 people. The size of the town was deliberately limited so as to preserve community feeling and responsive democratic government, both of which can so easily be lost in a big city. The plan for local industrial development has been successfully carried out, and there is extensive diversification of types of manufacturing.

Welwyn is a second garden city in England, about 10 miles closer to London than Letchworth, but still possessing the advantage of a site in open country. It was built during the 1920's and now has a population of about 10,000, with space for additional residential and industrial expansion. Both Letchworth and Welwyn are economically and socially balanced, free from the dangers of unguided growth and exploitation. They are good places for modern living and working.

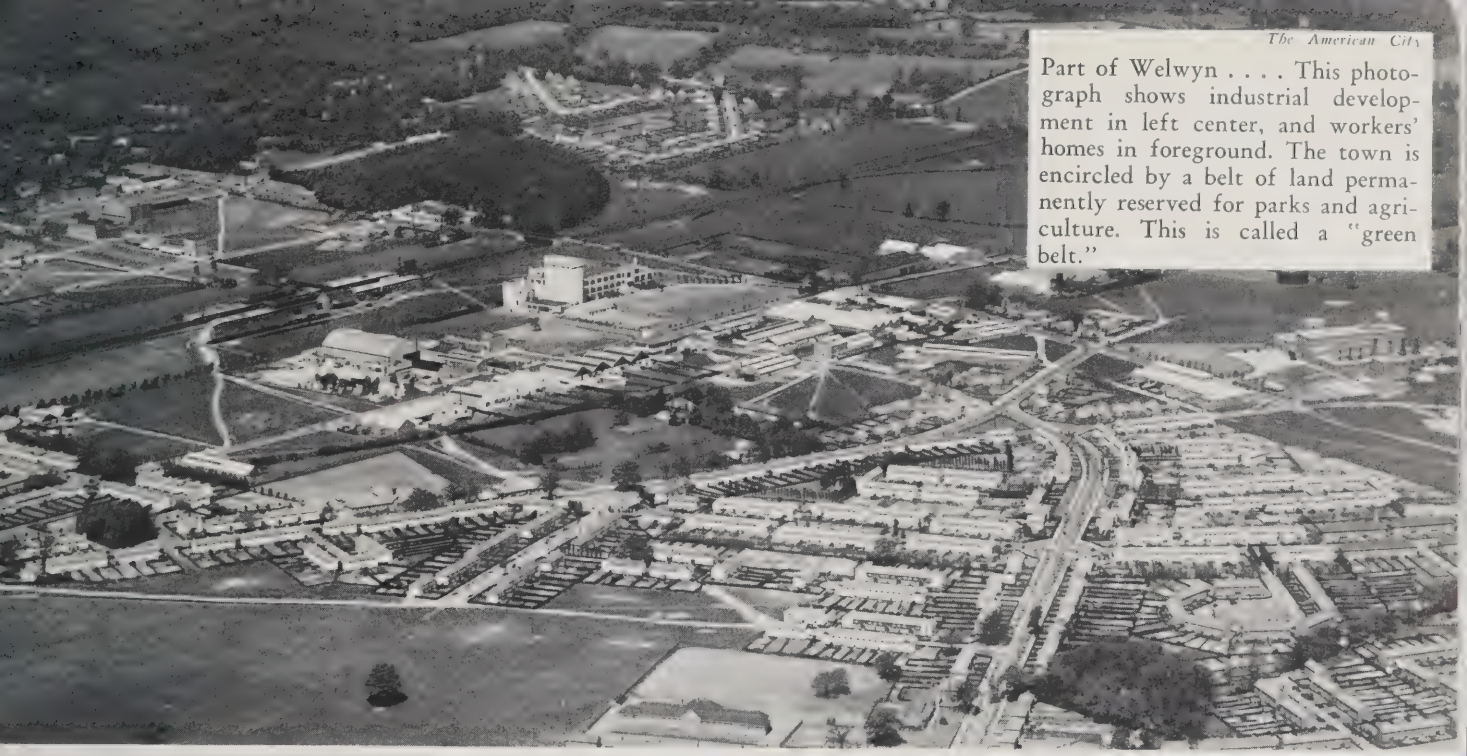
British Post-War Program for New Towns

The success of Letchworth and Welwyn has given impetus to the post-war program of the British government, adopted in 1946,

Plan of Letchworth . . . . Note large recreation areas virtually surrounding the town (shaded areas).

The American City

Sketch Plan of Stevenage . . . . The old town has a population of 5,500, and the new town will house 50,000. Most of the wage earners will work in local industries.



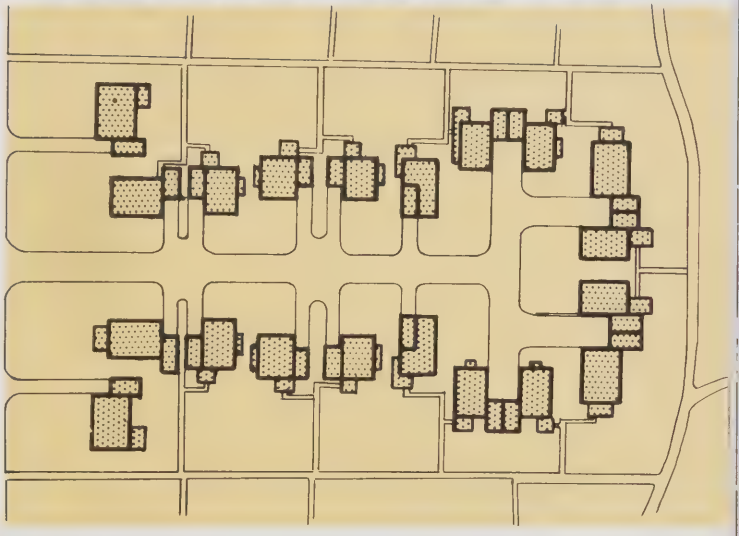
The American City

Part of Welwyn . . . . This photograph shows industrial development in left center, and workers' homes in foreground. The town is encircled by a belt of land permanently reserved for parks and agriculture. This is called a "green belt."

under which some 20 new self-contained towns of 30,000 to 60,000 population are to be built and settled by siphoning off excess population from too densely populated areas of London and other principal cities. The first of these new towns will be Stevenage, about 25 miles north of London.

Radburn, New Jersey

In the United States, aside from a few notable towns like Hershey, Pennsylvania, built by industries for their own employees, the first model town was Radburn, New Jersey. It has been described as "designed for the motor age", with cul-de-sac streets and complete separation of pedestrian and automobile traffic. Underpasses enable children to cross the more important streets without danger. Every child can walk to school without crossing a traffic thoroughfare. The individual homes face into park-like interiors of "super-blocks", and have their backs to cul-de-sac streets, which are used primarily for deliveries (see illustrations).



Radburn's Cul-de-Sac Street Unit . . . . The town plan includes a great many such units, designed to promote safety.

City Housing Corporation

Radburn, New Jersey . . . . An excellent example of a well planned small town. →

Greenbelt, Maryland . . . . Designed for safety. Note the many pedestrian paths. Housing comprises apartments and row houses.

Radburn was designed by two New York architects, Clarence Stein and the late Henry Wright. Like Letchworth and Welwyn, though smaller in scale, it was originally conceived as a complete town with homes, businesses and local industries. The depression of the early 1930's, however, curtailed the construction program, and Radburn has developed principally as a dormitory town, with local shopping facilities.

Greenbelt, Greenhills and Greendale

During the depression the federal government undertook the building of three dormitory towns, somewhat comparable in design to Radburn. These are Greenbelt in Maryland, near Washington, D. C.; Greenhills near Cincinnati; and Greendale near Milwaukee. In these towns, no attempt was made to provide for local industrial development. They are purely residential communities, lacking economic self-sufficiency, and house mainly a single social group — the middle-income white collar class. They have well planned neighborhood shopping centers with ample parking space. The stores, which supply all types of commodities and services needed in the daily life of the residents, include groceries, drug stores, bakeries, filling stations, tailor shops, and beauty parlors, but not department stores.

Neighborhood Shopping Centers

The accompanying illustrations show typical drive-in shopping centers laid out for convenience, efficiency and personal safety. They are frequently located on main highways in open country and provide large parking spaces, a variety of stores, and also offices, theaters and other places of amusement.

The American School and University

Plan of Greenhills, Ohio . . . . A well designed residential community. Note that the houses are all located away from the main highways.

Farmers Market, Los Angeles . . . . This large drive-in shopping center sells all kinds of general merchandise and clothing as well as farm products. It was first opened in 1934. There are now over 100 shops.

Drive-in Shopping Centers

College Park, Washington, D. C. Note automobile parking on roofs of stores.

Bellevue, Seattle, Washington. This development has 30 shops and a department store in the center.

Fresh Meadows Housing Development . . . . A section of New York Life Insurance Company's 3,000 family community in Queens, New York City, adjacent to a public park of 500 acres.

Stimulation of Large Scale New Building

There is little question that the advantages offered by the various model towns in England and America are doing much to improve the quality of design of post-war neighborhoods and communities. The chief difficulty with such undertakings is that private builders can seldom finance and construct whole towns, with shopping centers, parking spaces, community centers and industrial plants as well as residential neighborhoods with play space. The solutions seem to lie in attracting stronger financial interests, such as the large savings banks and life insurance companies; and also, in encouraging groups of small builders to pool their efforts so as to construct sizable communities rather than many small scattered developments. Both these solutions can be initiated and stimulated not only by local planning boards but by responsible citizens who will exert their influence toward creating better communities.

DECAYED RESIDENTAL AREAS AND THEIR REDEVELOPMENT

Overcrowding

When the run-down neighborhoods of our central cities are rebuilt, it is self-evident that we should avoid the past mistakes of overcrowding, jumbled uses of land and lack of planned guidance. Overcrowding of the land can be measured. Millions of families suffer from it. The most extreme American example is in Boston, where the old North End has population densities ranging up to 1100 persons per inhabited acre (i.e. excluding streets and parks). This maximum is the equivalent of a piece of ground measuring five by eight feet for each person — hardly enough for a grave! Such overcrowding is not equalled even in the tenement areas of New York's Harlem. Sound modern practice calls for not over 200 persons per acre in three-story apartments, and usually not more than 400 in higher buildings. In other words, each individual should be provided with a minimum of nine by twelve feet.

Boston's Crowded North End. Willi Sa

Jumbled Land Uses

The intermixture of residential, business and industrial land uses is particularly evident in old and decayed city areas. These neighborhoods have been slowly changing for generations but very few have been rebuilt in their entirety for any one particular type of present day activity. Families who live in such areas endure smoke and noise and smells and traffic hazards. Transitions from residence to business to industry have started and stopped and started again, but have rarely been completed.

Obsolescence and Deterioration of Structures

A special factor in these areas is the age, obsolescence and poor condition of their buildings. Despite all the developments of modern science, many people are living and working in worn-out, unsafe and unsanitary structures. Even if these buildings were repaired, they would still fall far short of today's minimum standards of design. To give another example from Boston's North End, more than half of its residential quarters are over 50 years old, and 85 per cent lack bathtubs or are in need of major repairs.

In New York, as recently as 1944, there were still over 57,000 obsolete tenement buildings, housing upwards of 400,000 families. Little demolition has taken place since that year. Virtually all such buildings are characterized by windowless interior sleeping rooms; or rooms that look out on narrow courts, or on sideyards only wide enough for passageways. Comparable conditions exist in greater or less degree in every large and in many small cities.

Boston Housing Authority

Mixed Business and Residences.

Boston Housing Authority

The West End, Boston.

Boston Housing Authority

The South End, Boston.

A Blighted Area. *Boston Housing Authority*

Obsolescence and Decay . . . . A run-down neighborhood. *Boston Housing Authority*

Health Conditions

Overcrowding and building decay are bad in themselves, but their contribution to the toll of disease and crime is even worse. One blighted area in Detroit had a pneumonia rate nearly three times the average for the city, and a tuberculosis rate over six times as great. In the South End district of Boston, the infant mortality rate over a five year period, 1941-45, was more than 50 per cent higher than the average for the city.[1] A five year survey in New York revealed that three out of every four babies living in dark tenements had rickets. Cleveland discovered that one of its slum sections, containing only 2.5 per cent of the city's population, contributed 6.8 per cent of the juvenile delinquency cases among boys, and 21.3 per cent of all the city's murder cases. In city after city, the story is very much the same.

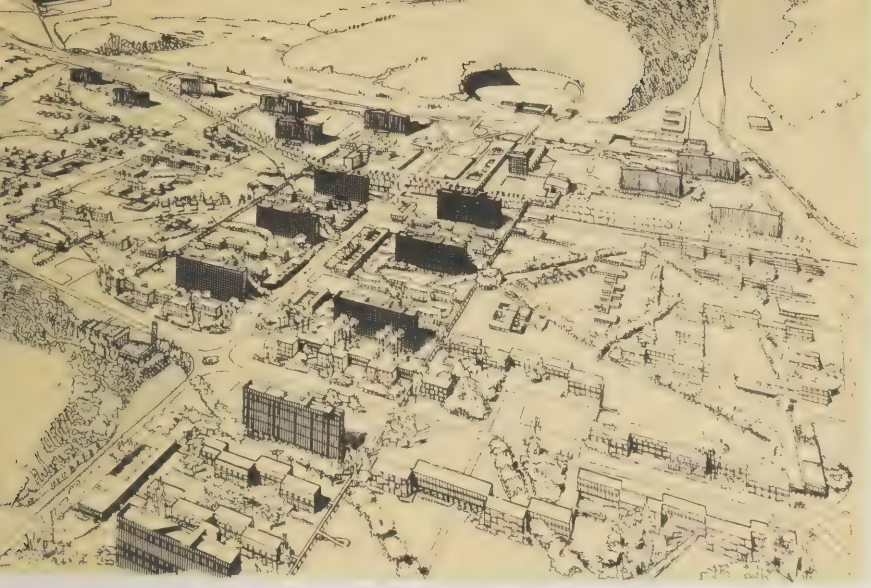
Clearance and Rebuilding

These outworn, outmoded districts where such conditions prevail are usually too dilapidated for piecemeal modernization of individual buildings. There is no question that existing structures should be kept in safe condition, in conformity with local ordinances. But these buildings are so poorly designed that they lack even the most fundamental essentials for healthful living. Residential and business structures are mixed together; and the very pattern of the street system is dangerous and ill-suited to good living conditions. It is now recognized that the only sound solution to the problem of decayed areas is large-scale clearance, and redevelopment with new buildings of modern types, arranged in modern patterns. Sites for reconstruction should cover several city blocks as a minimum so that some traffic streets may be closed, play spaces created, and sufficient distances provided between buildings to assure ample light and air.

[1] Statistics from City of Boston Health Department.

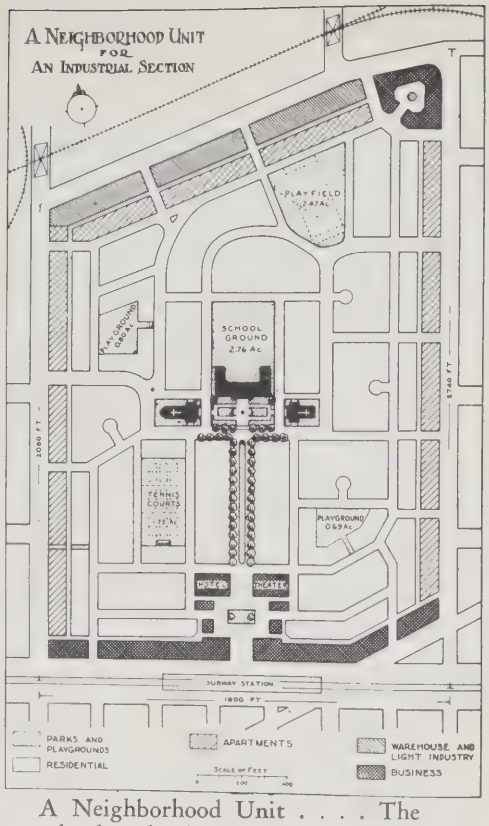
Thomas Airviews, N.Y.

Stuyvesant Town, New York City . . . . The largest private slum-clearance and redevelopment project in the United States. Peter Cooper Village (a smaller project) lies immediately behind Stuyvesant. Both are the work of the Metropolitan Life Insurance Company.



Progressive Architecture

Cidade dos Motores, Brazil . . . . A new industrial town designed for 25,000 population on a 12,000 acre site near Rio de Janeiro. Construction is in progress. Note the tall apartment houses and the tremendous amount of open space.



A Neighborhood Unit . . . . The school is the focal point.

Regional Plan Association, New York

Neighborhood Units

The trend of modern design is toward what is called the "neighborhood unit" — a community large enough to be served by its own public elementary school; to have its own playgrounds and small park; to support its own shopping center, health center, and branch library; and often to have its own churches as well. By eliminating unneeded streets, the old pattern of small city blocks is replaced by new "super-blocks". The streams of heavy automobile and truck traffic can then be routed around the neighborhood rather than through it. The buildings are arranged in groups so as to secure the maximum of sunshine and fresh air with spacious areas between for trees, grass and shrubbery. In this way, an environment of convenience and safety, health and restfulness can be achieved for all the residents. Future incursions of business and industry are prevented by zoning. The accompanying illustration shows a layout for a good neighborhood unit.

Examples of Private and Public Rebuilding

Efforts are being made in many cities to construct more large modern redevelopment projects in slum areas. In some cases it is feasible to replan and rebuild for families of much higher income than the present tenants. In other cases, because of location and special local factors, rebuilding is most logical for the same income group that now occupies the slums — a group that in most big cities embraces a substantial proportion of the inhabitants.

The largest private redevelopment project that has been undertaken in the United States is Stuyvesant Town, in the 14th Street and East River district of Manhattan. The site has an area of 61.5 acres (18 city blocks) and its 35 buildings will house 8,755 families. This vast enterprise, estimated to cost $50,000,000, is the work of the Metropolitan Life Insurance Company (see photograph).

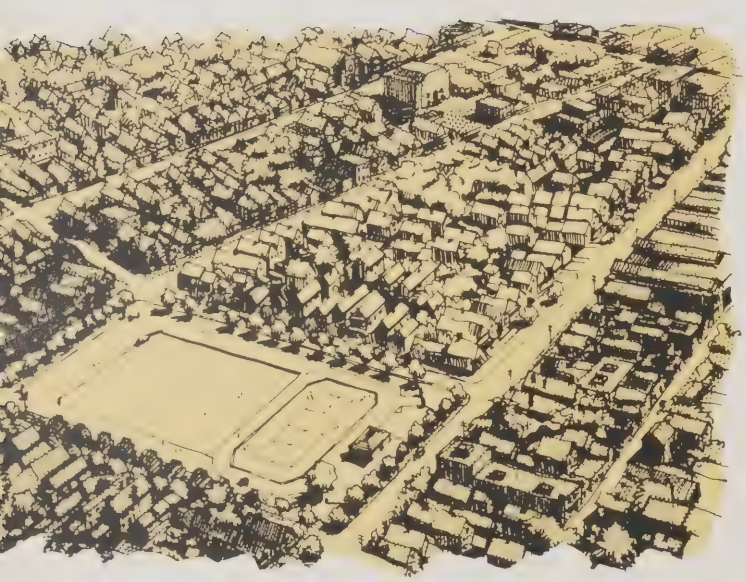
Public Housing Development, Tampa, Florida.

Federal Public Housing Authority

Before

After

Public Housing Development, Willert Park, Buffalo, N.Y.



Fort Greene Houses Brooklyn, N.Y.C. (See text, page 86)

New York City Housing Authority

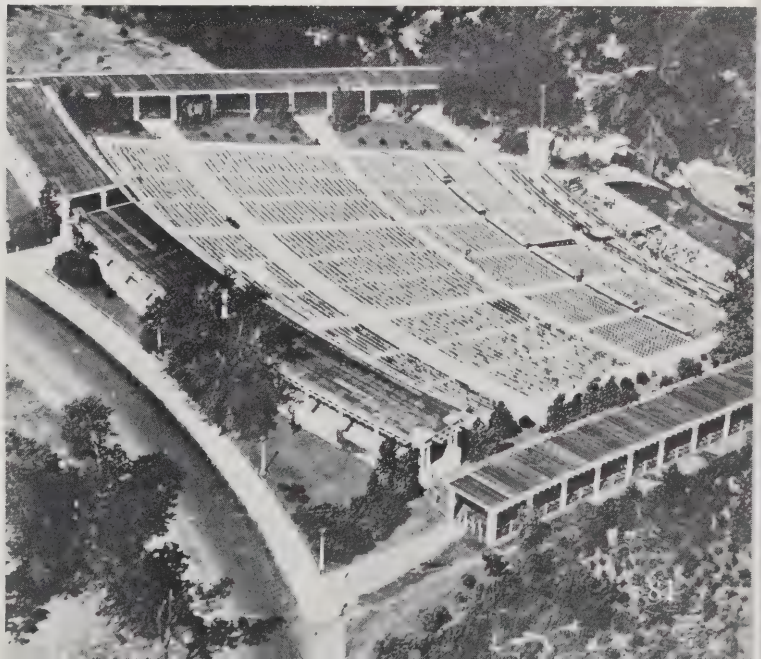
Parkchester, The Bronx, New York City . . . . This enormous development was built on a nearly vacant site by the Metropolitan Life Insurance Company. The buildings occupy only 27.4 per cent of the site area. *Fairchild Aerial Surveys Inc.*

In the field of low rent housing, the largest slum clearance and redevelopment project is Fort Greene Houses, completed in 1943 by the New York City Housing Authority on a site of 41.3 acres adjoining the Navy Yard in Brooklyn. It accommodates 3501 families.

Up to the present, public rebuilding projects (see illustrations) have been more numerous than those under private auspices. There is need for more adequate federal and state legislation, designed to attract private capital into undertakings of this kind, and thus achieve orderly large-scale rebuilding of the worn-out area of our cities.

U.S. Army A.A.F.

Amphitheater in St. Louis, Missouri . . . . Ideal for concerts and music festivals.



Parks and Play Space

Before redevelopment, it is important that builders and financiers, public officials and private citizens recognize the need for more public park and recreation space. These are basic elements in the redesign of neighborhoods for present and future generations.

A 40-hour week is now general practice in American industry. Many office people have even shorter hours. But, despite fewer hours of labor, the quickening tempo of the Machine Age has brought greater tension and nervous fatigue. The modern urban region must provide more recreational facilities to accommodate ever-increasing numbers of people and to help counteract the mental effects of the speed-up of modern life.

When our big cities were small, every person could reach open park-like land at a city's edges without great inconvenience, just as he still can in a small town. Now, there are tens of thousands who live in congested central neighborhoods without recreation space and who cannot afford the time and cost of a trip to open country. The pressure of city growth has created high land values in these central areas, and new parks are thus hardest to provide where they are needed most. Whenever rebuilding is undertaken on a large scale, with great areas of land cleared for the first time in generations, there is a unique opportunitiy to correct the mistake of having too little space for parks and play.

Hartford, Connecticut . . . . The State Capitol grounds, in left foreground, serve as a major city park.

American Airlines, Inc.

U.S. Army A.A.F.

The Boston Public Garden.

U.S. Army A.A.F.

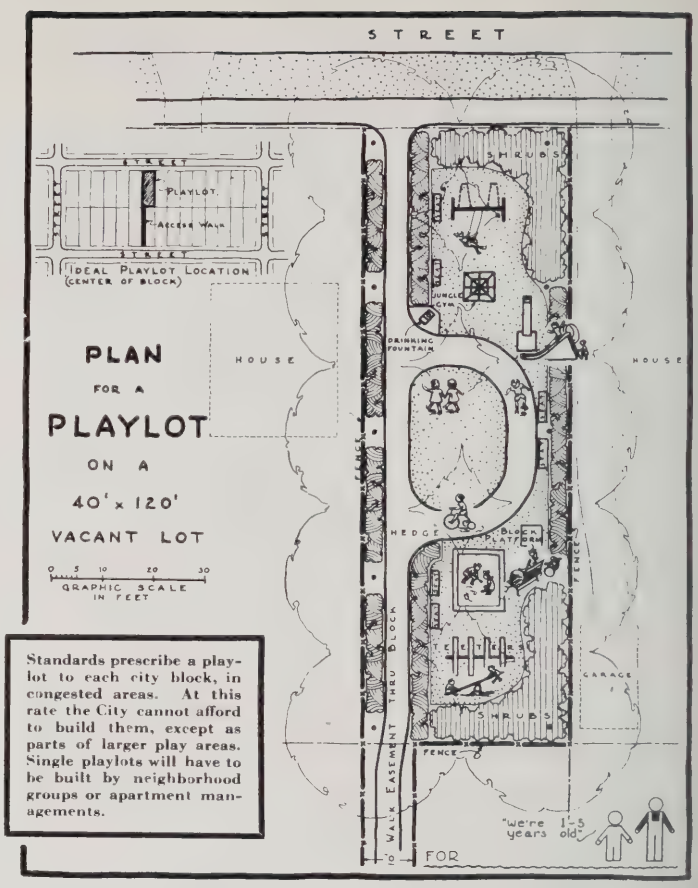
Looking across Manhattan Island . . . . Henry Hudson Parkway in foreground, and Central Park in center.

The Palisades along the Hudson River . . . . This area is part of the Palisades Interstate Park.

American Airlines, Inc.

The over-all need is a balanced park and playground system to meet the requirements of all age groups. The accompanying plans show the various types of recreation space that are needed. A small play lot for very young children should be part of the design of each residential block. It should be located so that mothers can watch their children from their windows. A larger neighborhood playground for youngsters from about 5 to 15 years is best situated next to the elementary school; it can be used during recreation periods and after school hours. The "play field" and the "athletic field" for youths and adults require 10 to 30 acres. Play fields are intended for informal games and recreation; while athletic fields are for highly organized sports such as high school football and baseball, which attract considerable crowds of spectators. Either a play field or an athletic field should be provided in the site layout for a high school.

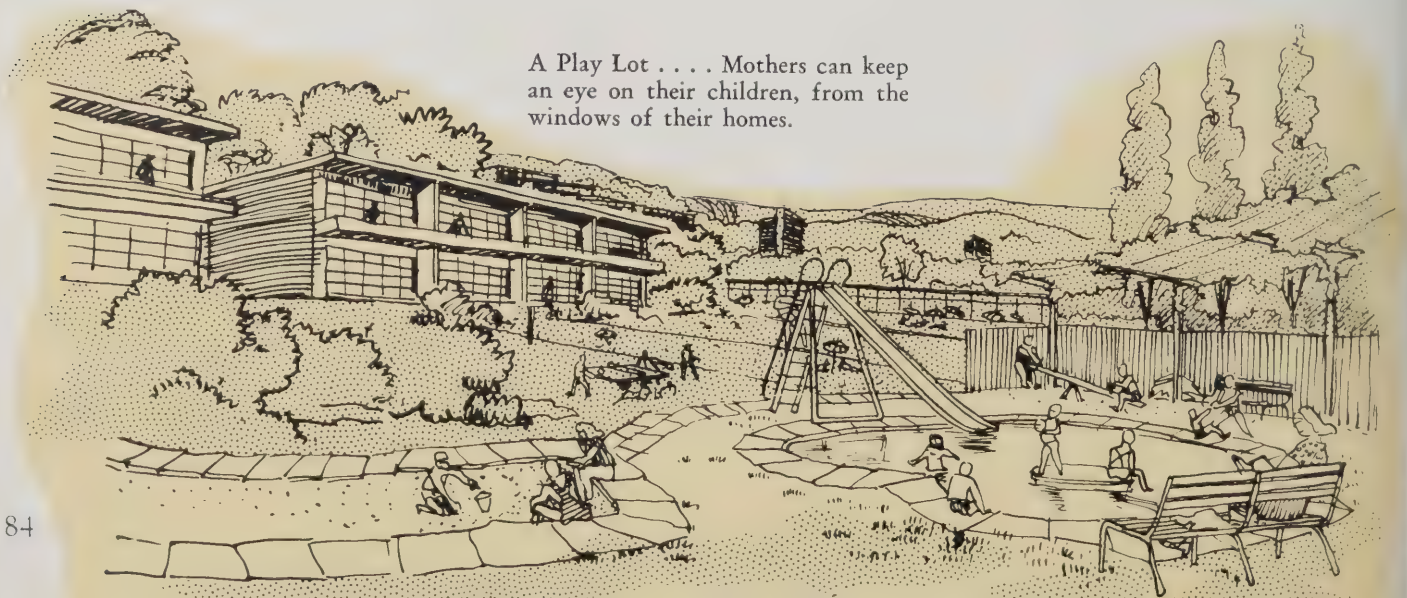
The neighborhood park is primarily for adults. It must be easy to reach, and should be planned for restfulness and natural beauty, rather than for active recreation. The age composition of America's population is changing and the proportion of elderly people is steadily increasing. Having reached the age of leisure, they deserve the quiet and relaxation that these parks afford.



Standards prescribe a playlot to each city block, in congested areas. At this rate the City cannot afford to build them, except as parts of larger play areas. Single playlots will have to be built by neighborhood groups or apartment managements.

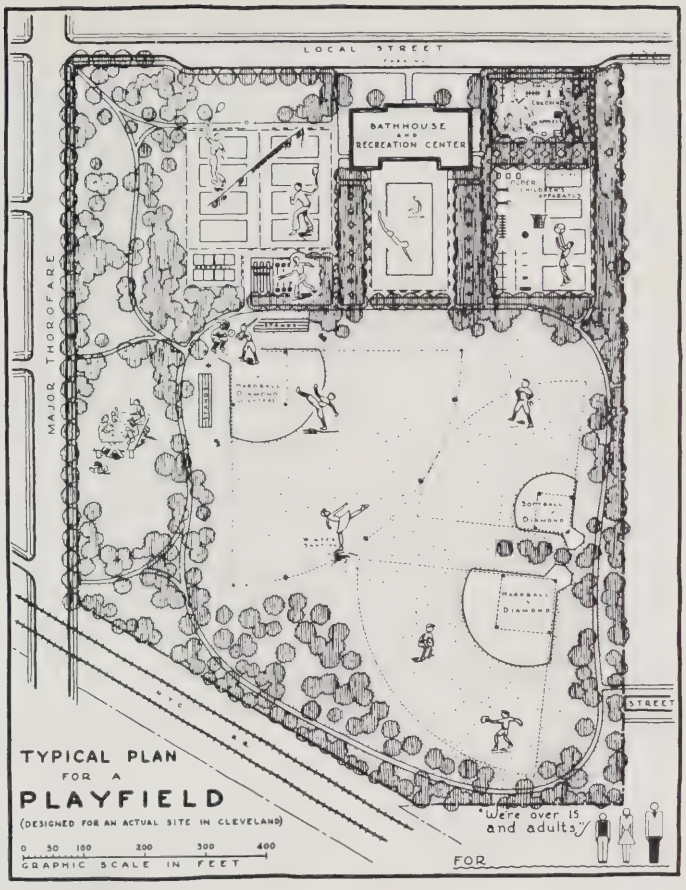
Cleveland City Planning Commission

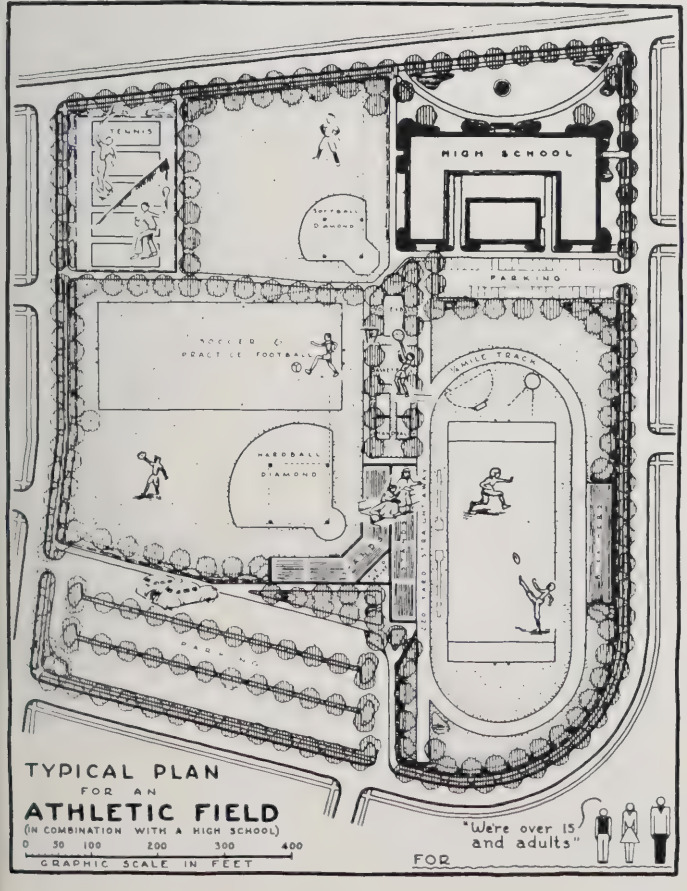
Some cities also lack a sufficient number of large parks, stadiums and outdoor theaters. These serve whole sections of the city, rather than the local neighborhoods. There should also be regional parks or reservations in the rural environs beyond the city limits, where people can spend the day and enjoy the unspoiled beauty of natural surroundings.

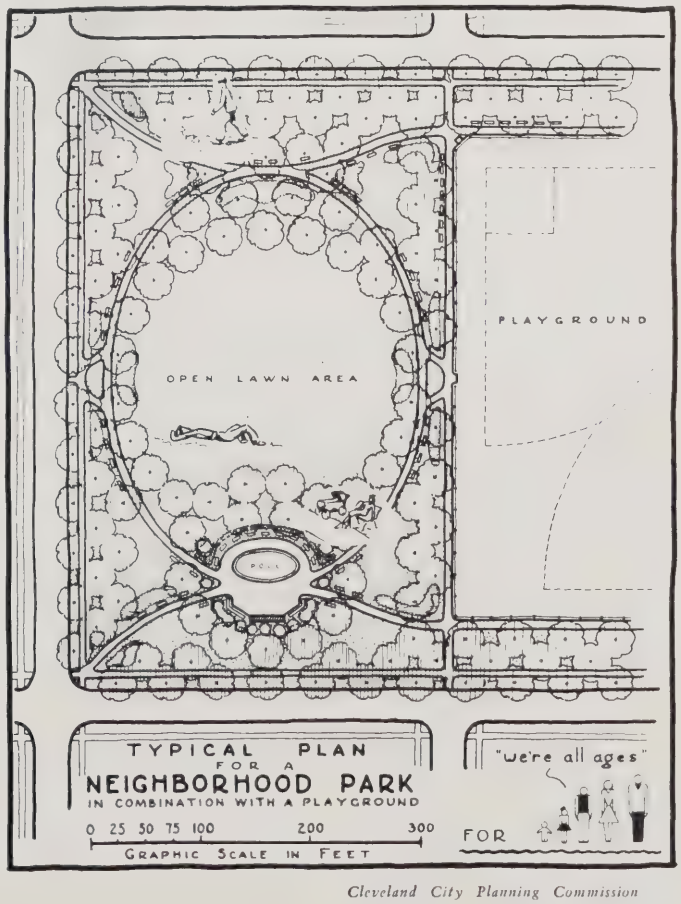


A Play Lot . . . . Mothers can keep an eye on their children, from the windows of their homes.

NEIGHBORHOOD PARK
SUMMER
WINTER
ELEMENTARY SCHOOL
PLAN FOR A PLAYGROUND
IN COMBINATION WITH SCHOOL & NEIGHBORHOOD PARK
GRAPHIC SCALE IN FEET
"were 5-15 years old"
FOR


LOCAL STREET
BATHHOUSE AND RECREATION CENTER
MAJOR THOROFARE
TYPICAL PLAN
FOR A
PLAYFIELD
(DESIGNED FOR AN ACTUAL SITE IN CLEVELAND)
GRAPHIC SCALE IN FEET
"We're over 15 and adults"
FOR


TENNIS
HIGH SCHOOL
PARKING
SOCCER & PRACTICE FOOTBALL
HARDBALL DIAMOND
TYPICAL PLAN
FOR AN
ATHLETIC FIELD
(IN COMBINATION WITH A HIGH SCHOOL)
GRAPHIC SCALE IN FEET
"We're over 15 and adults"
FOR


PLAYGROUND
OPEN LAWN AREA
TYPICAL PLAN
FOR A
NEIGHBORHOOD PARK
IN COMBINATION WITH A PLAYGROUND
GRAPHIC SCALE IN FEET
"We're all ages"
FOR

IV.

TRAFFIC, TRANSIT AND COMMUTING RAILROADS

TRAFFIC CONGESTION AND REMEDIES

Conflicting Purposes of Streets and Highways

City streets and rural highways both serve two basic purposes: (a) *movement* of vehicles, and (b) *access* to the homes, stores and factories that border them. As the amount of moving traffic increases and the demand for access to properties fronting on the streets grows greater, these two purposes evidently come in conflict with each other. *Movement* needs to be as continuous as possible to avoid the stops that result in traffic jams. *Access* requires stopping and parking.

There is another conflict: some moving traffic is purely local, seeking a nearby destination; other traffic is long-haul or inter-city, and should not be delayed by local vehicles.

Still another conflict exists among the interests of passenger cars, buses and street cars, trucks, and pedestrians, which interfere with one another. This third conflict applies not only to the moving streams but also to curb parking and to regulation of traffic at busy intersections.

At the present time, most city streets and highways in urban regions must accommodate both local and through traffic of all types. They serve no one interest to the best advantage.

Traffic Congestion

American Transit Association

Fay Foto Service, Inc.

Haymarket Square, Boston . . . . Scene of many traffic jams.

Boston Traffic Commission

Decentralization and Traffic Congestion

Every urban region is today confronted with the traffic problem resulting from decentralized growth and the fact that the automobile has become an increasingly important commuting vehicle. This problem can be summed up in one sentence: *Street and highway systems are obsolete and congested with traffic and better facilities must be planned and built.*

Our city streets in downtown areas are so overburdened by all the conflicting types and movements of traffic that it is evident that drastic remedies must be applied if we are to solve this problem and keep our cities free of congestion in the future.

Regional highways also have failed to keep pace with the suburban expansion they fostered and cannot carry the present load of traffic to and from main business centers. Many of these roads are far too narrow, inefficient and dangerous. They are often in the wrong locations, passing through the heart of every village and town along the way to the parent city. Every "Main Street" is a bottleneck, every intersection a hazard. Local merchants now agree with highway engineers that suburban business districts should be by-passed by new types of highways leading to the main business centers of the metropolis.

Obsolescence and Accidents

The basic street patterns of American cities have remained practically unchanged since their original street lines were laid out. True, most cities have widened a few of their streets, but this has provided only temporary relief rather than a cure

Waterfront Highway, Pittsburgh . . . . Note parking space, depressed highway in right center, and service roadway at extreme right. *American Transit Association*

Edward Saxe, Hartford

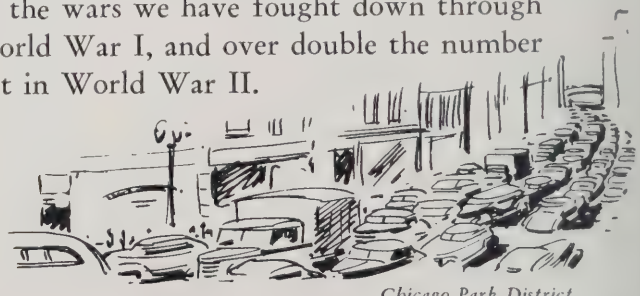
Depressed Express Highway . . . . passing through a heavily built-up district in Hartford, Connecticut.

Chicago Park District

Chicago's Outer Drive on the Lake Front
Looking south toward Field Museum of Natural History

for modern traffic problems. It does not alter the fundamental conflicts among the different purposes that the streets must serve. Cities were neither designed originally nor later replanned to meet the requirements of the Automobile Age, which has caused a revolution in the type and speed and efficiency of vehicular transport. It is not surprising that the 1946 flood of 34,373,000 automobiles and trucks on America's streets and highways resulted in a condition close to chaos. More than half the total annual vehicle mileage is driven on city streets, where congestion is far worse than on rural highways and far harder to remedy. Neither Boston's tortuous maze of streets nor Philadelphia's neat rectangular network of 50-foot streets can cope with today's necessities.

Obsolete design of streets and highways, congestion of traffic, and the speed of modern automobiles together combine to produce an appalling toll of accidents. The official records show that 633,406 men, women and children were killed in traffic in the United States during the years of peace from 1919 through 1941. This is *over double* the number of Americans killed in all the wars we have fought down through World War I, and over double the number lost in World War II.



Chicago Park District

← Chicago's Outer Drive on the Lake Front

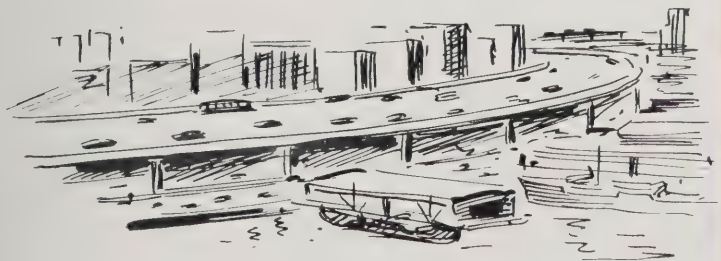
Eight-lane express parkway with movable concrete separators that can be raised or lowered between pairs of lanes. The roadway can be divided into four lanes each way or into two lanes in either direction and six lanes in the other to provide different traffic capacities at different times of day. In photograph, the right-hand white separator strip is elevated, giving two lanes for cars flowing away from the camera, and six lanes toward it.

Traffic congestion causes another major though less tragic loss. This is the *loss of time,*—a serious factor in the cost of living. It increases the expense of trucking raw materials and finished products to and from factories. It shortens the effective working hours of business men who are dependent on automobiles. Calculations of the value of lost time due to congestion are at the best approximate. A recent estimate for the territory of the New York metropolitan region gave a figure of at least $1,000,000 per day.

Express Highways and Parkways

Congestion, obsolete design, and conflicts between different kinds of traffic have directed people's thinking toward entirely new types of streets and highways. Enough mileage of these new types has now actually been built to prove beyond doubt that the correct answer has been found.

The modern solution is to build so-called "express highways" or "expressways" with *no* intersections at grade, *no* traffic lights, and widely separated connections with local streets and highways. Traffic can then travel uninterruptedly at reasonably high speeds. The express highway provides no direct access to bordering property, so this particular conflict is eliminated. It serves local



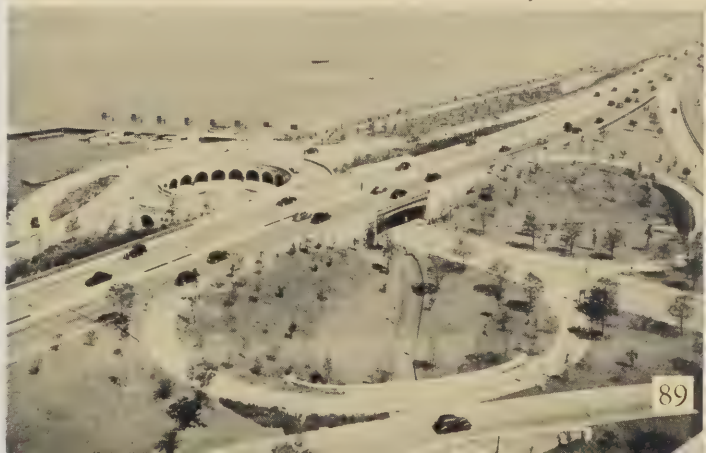
Ewing Galloway, N.Y.

Traffic Interchange on the Henry Hudson Parkway, Manhattan . . . . Special "clover leaf" at 79th Street. City Yacht Club basin in left background. There is an underground garage beneath the circle adjacent to the basin. →

Express Parkway Approach to Triborough Bridge, New York . . . . Highway is depressed below the ground level and all cross streets go over it on bridges. Service roadway at left. *Triborough Bridge and Tunnel Authority*

Miller Highway, New York . . . . An elevated express highway skirting the docks along the Hudson River. Note ramp leading to surface street.

Franklin D. Roosevelt Drive, New York . . . . Showing double deck express highway along the East River, with recreation space on the roof of the roadway structure.



traffic only incidentally, as the points where cars can enter or leave the highway are at least half a mile apart, and generally at more distant intervals. The express highway may be open to all types of traffic—passenger cars, trucks and buses—or may be restricted only to passenger cars.

Because of the many safety features that are built into express highway design, their accident record has been markedly more favorable than that of older types of roads, despite the greatly increased speed of travel. The Pennsylvania Turnpike Commission has reported a traffic death rate of only 10.7 per 100,000,000 vehicle miles on its expressway, as against 15.2 for all rural roads in the United States.[1]

When an express highway is cut through a built-up community, it is usually necessary to provide separate roadways, one on each side, to give access to abutting properties. Infrequent "lead ons" and "lead offs" are built as connections between these service roads and the expressway. By this means, access to the artery interferes very little with its express character. An express highway in open country can often be constructed without service roads. This type, continuously fenced on both sides except at major intersections, is technically known as a "freeway".

Minor crossroads are carried over or under the express highway by bridge or underpass, with no provision for access or traffic interchange. Major crossroads are connected with the express highway by special types of intersection design such as the "clover leaf", so that there is provision for entering or leaving the express highway and making all required left and right turns without crossing any traffic stream (see accompanying illustrations).

[1] Turnpike Accidents Compared with Rural Roads, by David M. Baldwin, published in Public Safety Magazine, December 1946.

Fairchild Aerial Surveys, Inc.

Henry Hudson Parkway, Manhattan . . . . A six-lane divided express parkway along the Hudson River.

New York City Park Dept.

Cross Bay Boulevard and Beach Channel Drive, Queens, N.Y.C.

American Transit Association

Southern State Parkway and Cross Island Parkway, Long Island, N.Y.

Triborough Bridge Approaches. *New York City Park Dept.*

Where intersecting streets are close together, as in built-up urban areas, particularly their central business districts, the express highway cannot feasibly be constructed at surface grade. It is necessary either to depress or to elevate the entire express highway so that it will be on a different level and not conflict with surface traffic on the existing street system. Elevated express highways are more costly to build and are detrimental to adjacent buildings. Depressed highways are usually to be preferred. The latter, however, require more land, as service roadways have to be located at their sides, whereas the elevated artery can utilize the land beneath it for necessary access to adjoining properties. The decision as to which should be built depends upon the particular location, land values, and other local conditions.

A very important, and now universal, feature of express highway design is the physical separation of opposing traffic streams. This is achieved by constructing a dividing strip in the center of the roadway. This strip is frequently made wide enough to be planted with grass and shrubbery, thus screening the glare of approaching headlights.

A "parkway" is a special type of highway, usually running through land owned by a park system. It is generally designed without direct intersections and traffic lights, and provides the other principal features of an express highway. Earlier parkways having such intersections and lights are now more accurately termed "park boulevards." The modern parkway is also generally reserved for the exclusive use of private passenger vehicles, with commercial traffic prohibited.

Such then are the highways of tomorrow. Their technical problems have been solved.

Fairchild Aerial Surveys, Inc.

Southern Parkway section of Belt Parkway, Queens, N.Y.C. Note "clover leaf" at top of picture.

Grand Central Parkway, Queens, N.Y.C. . . . . A depressed express parkway through a residential area, with service roads on both sides. *American Transit Association*

Davidson Highway, Detroit . . . . A good example of a modern depressed expressway through a residential neighborhood. *American Transit Association*

Traffic congestion *can* be cured. Today's main problem is not design but finance. It is the problem of finding funds to pay for enough express highways and parkways to carry our existing and future traffic. At present, federal and state governments are paying the greater part of the cost. Some rural express highways are being financed by collecting tolls. But the cost of all necessary projects is so enormous that it will take many years to do the whole job.

Modern express highways need no longer be considered as isolated examples of good practice. Many have been built, and many more are now on the drawing boards. Some of the best known existing arteries of this kind are shown in the accompanying illustrations. Every city and urban region is hard at work on plans and construction for these new types of highways. A number of the largest cities have already completed their first arteries and are planning others. Among the cities that are considering construction of their first expressways in the near future are Atlanta, Boston, Buffalo, Cleveland, Cincinnati, Kansas City, New Orleans, and Nashville. It seems probable that the most necessary urban express highways will be built within the next generation. During the same period, great progress should be made on the national network of rural freeways and parkways, of which the Pennsylvania Turnpike and Merritt Parkway in Connecticut are two outstanding examples.

Cahuenga Freeway, Los Angeles . . . . An eight-lane express highway, with street car tracks in the center strip, thus combining traffic and transit. *American Transit Association*

Merritt Parkway, Connecticut . . . . Showing "clover leaf" traffic separation in Norwalk. *Connecticut Highway Dept.*

Regional Highway Patterns

The ideal pattern for a system of express highways in an urban region would be a perfect spider web of radials and circumferentials. In practice, of course, the pattern is distorted by existing built-up centers and sub-centers; by hills, rivers and harbors; and by the lines of already established highways. Express highways are fed by minor or "secondary" arteries, which in turn are the backbone of the network of purely local streets.

In determining the order of urgency of express highway construction, the federal government has now adopted the policy of building gradually *outward* from central urban districts to the suburbs, and thence to the open country beyond. In earlier years, federal and state highway funds were available only for rural routes. As a consequence greater progress has been made on rural than on urban construction. Because traffic congestion is at its worst in central areas, the new policy is obviously the correct one.

New York City Park Dept.

Three-Level Traffic Separation . . . . Cross Island Parkway and Bronx-Whitestone Bridge Approach, Queens, N.Y.C.

Off-Street Parking and Loading Facilities

When the vast volume of passenger and commercial traffic on the express highways and other major thoroughfares reaches its destination in the central city, where does it find a place to stop? Most cars and trucks park on the streets. Streets that are already too narrow to handle the moving stream of traffic are made narrower by lines of standing vehicles parked solidly along their curbs. The solution should be obvious. Let the full width of the roadway be utilized for *moving* vehicles wherever necessary and feasible; and let there be adequate off-street parking spaces for standing vehicles, and off-street loading spaces for trucks. This solution is imperative not only for the great business centers of our major cities, but also for every sub-center in every urban region.

To build modern highways without off-street parking facilities is comparable to building railroads without stations. These parking spaces need to be located in close proximity to the principal business and manufacturing areas of the central city, and also in all suburban business districts. They should be readily accessible to express highways so as to minimize travel of vehicles on local streets.

Many modern buildings, like RKO in New York and Carew Tower in Cincinnati, include parking garages within their structures. An increasing number of department stores and large chain stores are providing

Lake Front Parking Space, Chicago . . . . Space for 3500 cars, close to the heart of the business district. Illinois Central Railroad yards in foreground. *Chicago Park District*

parking facilities for their customers. Despite constructive steps such as these, city governments have been obliged to recognize that the parking problem cannot be solved by private enterprise alone. They are therefore establishing municipal parking lots and garages (see illustrations). The Chicago Park District operates a 3500-car surface parking space adjacent to the business district. Boston has acquired public off-street parking sites.[1] The City of San Francisco built a four-story garage under its Union Square, with a capacity of 1700 cars. Similar underground projects are being studied in Newark, Detroit, Boston and other cities.

On downtown city streets that are wide enough to permit curb parking without impeding moving traffic, the time allowed for parking must be carefully determined and then *enforced*. In this way the privilege of parking at the curb can be fairly divided among as many cars as is feasible. As of June 1947, more than 1200 cities had already found that parking meters are effective as a means of securing adequate and impartial enforcement of parking regulations.

Curbside loading and unloading of trucks not only snarls up moving traffic, but is also a slow, inefficient and expensive operation for trucking companies and business firms. The most up-to-date commercial buildings now provide loading bays within their structures so that trucks can back in from the street to platforms served directly by freight elevators.

Additional discussion of this subject is given in Chapter X,[2] as off-street facilities for both parking and trucking are proper fields for exercise of the legal procedures of zoning.

TRANSIT AND COMMUTING RAILROADS

Street Cars, Buses, Elevateds and Subways

Urban transit systems started with horse-drawn buses, and soon were followed by "horse-cars" running on rails. Their successors are the electric street car, the elevated and subway train, the motor bus, and the

[1] See page 202

[2] See page 145.

Combined Retail Store and Garage . . . . Girard Center, Philadelphia. *Fay Foto Service, Inc.*

"trackless trolley", which is a bus powered by overhead electric wires.

The first elevated railway was a short-haul steam railroad in New York, opened to service in 1871. The first subway for electric trolley cars was the Tremont Street line in Boston, which began operation in 1898. For many years thereafter, all new transit was provided by electric street cars, motor buses and electric elevated or subway trains. Beginning in the 1920's, buses and trackless trolleys began to replace street car lines; and in the 1930's the elevateds started to yield their place to new subways. Street cars have lost much of their earlier popular favor; and elevated railways are considered noisy and damaging to abutting properties. In New York's Manhattan, the last street car route was discontinued in 1947, and only one of the four elevated railways still remains.[1]

It has been pointed out that the street car, elevated and subway lines were the forerunner of the automobile in encouraging the suburban trend, just as they in turn were preceded by commuting railroads. As these transit lines were extended farther and farther from the centers of cities, the increasing area they served was opened for residential development and gradually built-up with apartment houses and individual homes. The inescapable consequence has been congestion — and even more congestion — in the street cars and transit trains. Transit companies ran longer and more frequent trains until the capacity of their tracks was reached. In New York, more and more subways have been built, including subways on top of subways.

Most American cities, including many of the largest, have only street cars, buses and trackless trolleys. Rapid transit lines — elevateds and subways — exist only in a very

Off-Street Parking Block . . . . Free parking in Oakland, California. *American Retail Federation*

San Francisco's Underground Garage . . . . Four stories of parking under Union Square. Capacity is 1700 cars. Entrances and exits on all four sides. *Fay Foto Service, Inc.*

[1] Parts of the Broadway "subway" are also carried on elevated structures.

few cities, of which New York, Boston, Chicago, and Philadelphia are the most important.

For many years, the trend has been toward public ownership and unified operation of all transit and rapid transit systems serving any one urban region. New York City now owns all its subways and elevateds and some of its bus lines. In the Boston area, most of the transit lines are similarly under public ownership.[1] In 1947, a public transit authority in Chicago took over the elevated railroad system and consolidated it with the operation of the new subways. Unified ownership simplifies unified planning for future additions to transit systems.

Relation of Highways to Transit

It is very important to realize that the structure of our great urban regions is knit together by a combination of highways and public transportation. Both have contributed to the pattern of growth and decentralization. Neither one alone can handle the future increase of metropolitan passenger and commercial traffic.

New express highways have not cured transit jams, and new subways have not solved highway traffic congestion. Better transit and better highways are both essential parts of the modern transportation network. The problem is not *which* to build, but how much more of each. Probably no region could afford a completely adequate system of express highways and subways. When better facilities of both kinds are not provided, business and industry move from the central city because it is no longer sufficiently accessible.

Cities are today face to face with this problem of commercial decentralization. While it is usually admitted that centralization went to extremes in the biggest cities, it is nevertheless true that any large-scale exodus of business and manufacturing would weaken the parent city so greatly that it could no longer maintain its vitality. It becomes clear that the problem of metropolitan decentralization is inseparably connected with the problem of adequate highways and adequate transit. The solution to be desired is a stable balance between the forces of centralization and decentralization, so that neither the parent city nor the suburbs will gain at the expense of the other. This equilibrium can best be achieved by providing more transit and more highways, thus securing a reasonably adequate framework of transportation for people and goods, into and out of the urban center.

Streamlined Passenger Train with Diesel-Electric Locomotive.

[1] See page 205 for discussion of the Metropolitan Transit Authority's system.

In recent years, all new transit facilities have been either subways, bus routes, or in special cases, trackless trolley lines. Subways are so expensive to construct that they are justified only in very thickly settled areas; or in rapidly growing urban regions where new apartment house developments are sure to be built. There are few urban regions that are still growing rapidly. It may therefore be anticipated that future subway construction will be largely confined to the central areas of cities.

The motor bus is the most flexible form of mass transportation. It requires no tunnel, no tracks, and no power line. It can be rerouted overnight. However, the bus suffers from the same street traffic congestion that delays passenger cars and trucks. In the heart of any city, travel by bus is much slower than by subway. The running time of buses is often unpredictable. Depending on traffic conditions, the same trip may take as little as 10 minutes or as long as half an hour.

With the advent of metropolitan express highways, the future of the bus takes on an entirely new complexion. Express highways can very easily provide for express bus routes. Speed on such buses is nearly as fast as on subways. Hence, as modern highways are constructed, we may expect that future transit service will be furnished more and more by buses, rather than by additional subways. The accompanying illustration shows a project of this kind, with an interchange station at an important intersecting artery. This further emphasizes the principle that highways and transit go hand in hand and are not competing facilities.

Advanced design for express highway with street car and bus station. *American Transit Association*

Commuting Railroads

Metropolitan growth began with the railroads. Without them there could have been no thriving suburbs for our large cities. Rapid transit lines and automobile commuting merely accelerated the trend of decentralization. Rail commutation has fallen off during the past generation but remains — and will remain — an essential part of the metropolitan circulation system. Many commuting roads have been electrified, terminal facilities made more efficient, and railway coaches improved in quality and riding comfort.

A major problem facing the railroads is maintenance of service on minor lines that are financial liabilities because they have lost so much traffic to public transit and private automobiles. When these losses cannot be absorbed by the profitable operation of other parts of a railroad's system, it may become necessary to discontinue such lines. Some other equally good public transportation must then be supplied. Depending on circumstances, this may be furnished by street cars or rapid transit trains running on the railroad trackage and connecting with the existing transit system; or by express buses on express highways that closely parallel the old railroad.

Marsh Photographic Studi

Cincinnati's Union Station . . . . The impressive station plaza and park were created by tearing down old buildings similar to thos seen at left.

American Airlines, Inc.

Washington's Union Station . . . . Rear view, showing tracks, platforms, and back of station building. The Capitol is in center background, beyond the station plaza.

Another major problem arises because short-haul railroad commuting service from suburban towns generally utilizes the same passenger terminal and the same tracks as trunk line trains coming from distant cities. Terminal capacity or track capacity then becomes the limiting factor in expanding the schedule of commuter trains to meet the population growth of the territory. The four-track tunnel serving Grand Central Station in New York cannot carry any more trains in rush hours, even though three of the four tracks are used to bring people into town in the morning, and three tracks to take them home at night.

In some cities, transportation planning studies will indicate the need for new or enlarged rail terminals, with more tracks leading into them. In other cities it may be found financially practical to provide separate terminals for commuting and trunk line traffic.

There are many instances where desirable improvements in rail commutation are difficult to achieve because railroads cannot afford the cost. No general remedy for such situations can be suggested, as there are complicating factors that vary from region to region. Some form of consolidation of railroad commuting lines with the street car and rapid transit system may be the eventual solution, with a public authority as the new owner and operator of the enlarged network.

V.

BUSINESS, INDUSTRY AND MOVEMENT OF GOODS

CENTRAL BUSINESS DISTRICTS

Location, Concentration and Congestion

Each week day morning, hordes of men and women from all the residential areas of the parent city, and from all the communities that cluster around it, converge upon the central business district. It is the focal point of the whole region, and the mainstay of its prosperity. Its towering skyscrapers bear witness to the fact that in business, *location* is essential for success. The most desirable locations are naturally those that are the most accessible, namely where transportation lines meet or intersect. For convenience and efficiency, business firms need to be accessible to each other and to their customers. We have insurance districts, financial districts, retail districts, and theater districts, but these different districts usually overlap to some extent.

The first skyscrapers had space between them and thus afforded ample light and air, and also panoramic views from their windows. As the demand for the best locations grew, more and more skyscrapers were built closer and closer together to accommodate as many people as possible, with the result that the central districts of our largest cities are now a serried mass of tall buildings. They overshadow the narrow canyons of streets and only their towers stand free and clear in enjoyment of sunlight, air and view.

Midtown Manhattan, New York . . . . Towers and building set-backs. *Fairchild Aerial Surveys, Inc.*

Downtown Boston *Boston Chamber of Comm*

Excessive building height and bulk have overloaded the streets and sidewalks and transit systems. Regulation by zoning came too late to control the bulk of the early skyscrapers, but has greatly improved the design of structures erected during the past generation. The tower and the "building setback," as illustrated, are both products of zoning. They assure better light and air and less shadowing of adjacent properties than was formerly achieved.

Some cities, including New York, Chicago and Boston, have more than one major business district. Each of these districts has developed because of good location and good transit service. Over-congestion of the original center has usually been a factor in stimulating the growth of a new center.

It is clear to every city-dweller that the problems of central business districts all stem from the emphasis on location. Concentration has brought not convenience but congestion, not efficiency but frustration. We have pursued the ideal of location to the point of destroying its advantages. We have over-centralized.

Patterns for Future Rebuilding

To correct this mistake of the past is not easy. To some extent, it is correcting itself by operation of the inexorable law of supply and demand. Some business firms and retail stores are moving away from the most congested areas. In a thinning market, the older and less desirable structures cannot compete for tenants and are torn down, leaving vacant lots in the heart of the downtown area. These lots are used for much needed parking space to serve the newer and better buildings.

No American city can redesign and rebuild its whole central business district as one project. Many great European cities that were destroyed during World War II are able to do this. Warsaw, Berlin, Rotterdam and London, to name only a few, have made reconstruction plans and will rebuild on modern principles that avoid the obvious mistakes of over-concentration and resulting congestion. In the United States, on the other hand, rebuilding will be a very gradual process. There will be time for us to learn much from Europe's post-war thinking and practice.

Providence *American Airlines, Inc.*

Cincinnati *American Airlines, Inc.*

American Airlines, Inc.

Detroit . . . . The street system of this part of the downtown district was laid out in 1807.

If we were to rebuild some part of an American business district — let us say an area of obsolete worn-out structures — what would we seek to achieve? What principles would guide us? What permanent solutions to the problem of congestion would we strive for? There are many answers. Let us state some of the points on which there would be general agreement.

First, we recognize that the best office space is in the skyscraper tower, and that the building mass below the tower is less desirable. So we should build only very tall towers, spaced well apart. Or we could construct towers interconnected by low buildings of two or three stories. These could have retail shops on their ground floors, and garage space above. Their roofs could be planted with grass and shrubs to create quiet parks for noon hour relaxation. To check congestion, we would limit the size of skyscrapers so that the aggregate floor area of the whole district would be somewhat less than in today's downtown centers. Every tall building would have 100 per cent daylight office space and a high degree of sunlight penetration.

Second, to develop this pattern of towers, it would be essential to have control over large building sites — often much larger than single city blocks. Many existing minor traffic streets would preferably be closed so as to create "super-blocks," as has previously been suggested in the discussion on rebuilding old residential areas.

Third, the main traffic streets would be wider than they are now, and we would build express highways, preferably depressed below surface grade, near but not through the business district. The major streets should be about 150 feet wide, and the express highways should carry six or eight lanes of

vehicles, depending on estimated future traffic flow. Sidewalks on the main streets could be partially under the buildings in arcades, so that shoppers could enjoy looking at window displays, regardless of the weather. Second story sidewalk arcades would also be a possibility (see illustration).

Fourth, every building would have sufficient garage space or outdoor parking space to meet its own needs, as determined by the volume of automobile traffic it would generate. This space could be either within the building or conviently near. There would also be public off-street parking facilities for general use. No cars would be allowed to park at the curb and thereby preempt street space that is essential for moving vehicles.

Fifth, all buildings would provide loading bays for trucks inside the building, so that there would be no handling of merchandise and freight across the sidewalk from the curb.

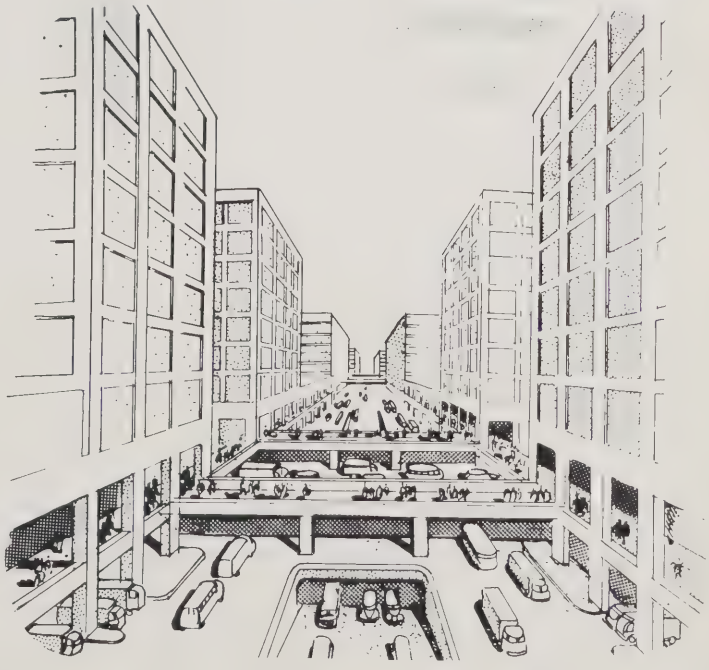
Sixth, we would redesign and expand the subway stations and their approaches, so that every large building would have underground pedestrian access direct from its basement to the nearest station. These pedestrian passages could lead past the basement show windows of stores.

These six ideas may seem to envisage a degree of perfection that is too idealistic, and most improbable of accomplishment. Yet most of these things have been done, as the following examples show.

The Empire State Building fronts on Fifth Avenue as a structure of only five stories; the great tower is set far back from the Fifth Avenue sidewalk. In the Rockefeller Center group, the tall buildings are well separated from each other, with low structures between them. There are gardens on many of the roofs.

Thomas Airviews

Rockefeller Center, New York . . . . A balanced grouping of high and low office buildings on a spacious site. Note that the tower structures stand well apart from each other.



Arcaded Street . . . . This design provides truck loading bays on surface streets, and arcaded sidewalks at second story level. There are overhead bridges and a vehicular underpass.

The Stuyvesant Town housing development in New York involved the elimination of many streets and the creation of superblocks. This could also be done in a business area if one owner had control of all the property on both sides of the streets. It is going to be done on the site of the United Nations headquarters (see illustration on page 147).

There are numerous examples of arcaded sidewalks. The rue de Rivoli in Paris, illustrated on page 127, is noteworthy in this respect. In Singapore, most of the business buildings have arcades to protect pedestrians from the tropical sun.

Parking garages and truck loading berths are not new. They are customary features in the design of most of the important modern office buildings and hotels.

Many department stores, unable to include parking space within their main retail buildings, have erected garages on nearby property. Though these are primarily for their own customers, parking is also made available to the general public. Two such department store garages are illustrated here.

Leo Fish Foto

New York Life Insurance Building, New York . . . . An example of effective skyscraper design, with ample setbacks to provide light and air.

Department Store Garages

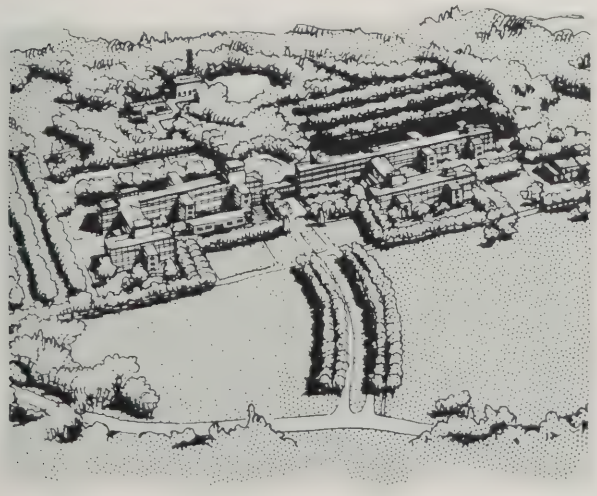
Cincinnati, Ohio. Capacity is 1059 cars.

Houston, Texas. Capacity is 590 cars.

Willow Run .... A portion of a vast war industry plant, now used by Kaiser-Fraser Motor Company. *Ewing Galloway*

Basement connections to subways, with their opportunity for show windows, are an accepted feature of sub-surface design. Gimbels, in New York, has show windows the entire length of the passageway from Sixth to Seventh Avenue. Filene's, in Boston, has similar show windows along the concourse of the Summer-Washington subway station.

What is here suggested for the future of our central business districts is thus not unrealistic. It is merely the combination of the best features of design that have already been tested by actual experience. Today, we seldom find all these features in one group of buildings. The Rockefeller Center in New York comes closest to combining all of them. In the future, we may anticipate more large-scale rebuilding operations, with greater attention to proven methods of overcoming past shortcomings. We shall then achieve better office working conditions, a new freedom from congestion, and stability of downtown property values. We shall not sacrifice the advantages of good location, but we shall make sure that those advantages are not nullified by over-concentration.



Bell Telephone Laboratories, Murray Hill, N. J. .... An industrial research plant in open country.

INDUSTRY

Just as the power of a great city is based upon the prosperity of the business establishments concentrated in its downtown center, so the power of the metropolitan region derives from its manufacturing plants and the transportation of their products. Industries are roughly classified as "light" or "heavy", depending upon the nature of their operations.

Light Industry

Light industries include the making of clothing, leather goods, small electric equipment, tobacco products, candy, and innumerable articles that do not require large plants or powerful machinery. The scale of activity is usually small. Light industries can be conducted in multi-story buildings at central locations. They do not produce obnoxious smoke, fumes or odors. Two out-

standing examples of light industrial areas are the garment district in Manhattan and the leather district in Boston. In both cases, there are tall modern structures given over to these industries and housing a large number of separate companies.

Many light industries occupy old buildings that are no longer satisfactory, as their floor space is inadequate and inefficient for modern machine operations. These obsolete buildings are often intermingled with business houses, old tenements and retail stores, so that efficiency is further reduced by street traffic congestion. There is need for more new loft buildings of efficient modern design to replace these outworn, outmoded structures.

Heavy Industry

Heavy industries embrace most of the large manufacturing operations, such as blast furnaces, steel rolling mills, shipbuilding, cattle slaughtering and petroleum refining. They require large site and floor areas, and a single concern usually occupies an entire building or group of buildings. Some of these heavy industries emit obnoxious smoke, fumes and odors, and are therefore bad neighbors. They are manifestly out of place in downtown business districts. They should be located away from the heart of the city, and adjacent to railroad tracks, port facilities, or both.

As the modern trend is toward belt line production on a single floor, big industries now seek outlying areas rather than central locations so that they can acquire large tracts of vacant land at reasonable prices. They usually erect buildings of only one or two stories that cover many acres. During a recent 11 year period before World War II, no less than 127 manufacturing companies moved out of the city of Chicago to locations in adjacent suburban areas.[1] Modern production methods are thus contributing to the decentralization of industry.

There are other factors of great importance in the choice of a location for a large industry. Among these are: markets for its products; a plentiful labor supply; good transportation; freedom from congestion; nearness to sources of raw material; nearness to related industries; available buildings; cheap power and fuel; and satisfactory living conditions for its workers. The level of local real estate taxes is also a factor, though not usually a determining one.

[1] Industrial and Commercial Background for Planning Chicago, page 97. Published by Chicago Plan Commission, 1942.

Ford Motor Company's River Rouge Plant. *A. Devaney, Inc., N.Y.*

United States Steel Corporation . . . . Part of plant at Gary, Indiana. *American Airlines, Inc.*

Philadelphia *U.S. Army A.A.F.*

Diversification of Industry

Urban regions prosper best over the years when they have a healthy range of different kinds of manufacturing. They need light industries and heavy industries, each in turn diversified to include many types of products. The "one-industry town" is very vulnerable to economic changes. Dayton, Ohio, for instance, having 80 per cent of its manufacturing employment concentrated in the tire and rubber industry, was very hard hit in the depression of the 1930's.

The extent of industrial diversification that can be achieved depends not only on the location and resources of the region; but also upon the judgment and initiative of local organizations engaged in attracting new enterprises.

Planned Industrial Districts[2]

As industries have many special requirements and have to be segregated from business and residences, their efficiency can be greatly enhanced by laying out carefully planned industrial districts with buildings tailored to particular needs.

A large corporation can buy a tract of land, and design and build its own group of factories with all the features it desires. Small companies cannot. They may rent a building, or part of one, or construct their own building; but they usually cannot afford the facilities enjoyed by the large corporation. It is through cooperative action with other companies that they can best secure such facilities.

The United States furnishes many ex-

[2] Much of the statistical material in this section is from "Organized Industrial Districts", by Robert L. Wrigley, Jr., published in The Journal of Land and Public Utility Economics, May 1947.

St. Louis *U.S. Army A.A.F.*

amples of this kind of cooperative enterprise. In each case, a private development corporation acquires a large acreage of industrial land; lays out and builds necessary streets and railroad spur tracks; installs water mains and utilities; provides storage warehouses; constructs docks, if the location is on a waterfront; and then sells or leases parcels of land or buildings to individual industrial companies. The corporation undertakes to finance both land purchases and construction costs. It usually erects the buildings, relieving individual industries of this problem. Location and style of all structures are made to conform with general plans for the development of the entire tract. The corporation usually maintains appropriate cafeterias, club rooms, and medical clinics. It centralizes the management of all rail and truck operations. The cost of these many features is included in the lease or purchase agreements of the individual companies, which thus obtain an extent and quality of service that they could not otherwise afford.

In Chicago, there are two outstandingly successful organizations of this kind: the Central Manufacturing District, which has six tracts of land aggregating 850 acres, with

Fairchild Aerial Surveys, Inc

The Boston Wharf Company's Industrial District . . . . An important group of manufacturing buildings (right center) owned by one company and leased to large and small industries. The location is South Boston. Fort Point Channel at right.

approximately 335 industrial firms; and the Clearing Industrial District with seven locations, totalling 2100 acres of land in and near Chicago, with 135 manufacturing companies. One of these seven locations — 1,300 acres — is a recent acquisition now in process of development.

Other similar examples are Bush Terminal in New York; the Fairfax and the North Kansas City Industrial Districts in Kansas City; Northwest Terminal Company in Minneapolis; and — probably the first of its kind — the Boston Wharf Company, incorporated in 1836. This latter company controls nearly 100 buildings with 4,500,000 square feet of floor area.

The two British garden cities, Letchworth and Welwyn, have been described in Chapter III. Both are private developments designed to be largely self-contained industrial towns. Great Britain has also built many so-called "trading estates", which correspond to the privately owned and operated American industrial districts. Some of these include adjacent residential areas to house employees and their families. Trafford Park Estate near

Kansas City, Missouri *U.S. Army A.A.F.*

Manchester, and Slough Trading Estate, north of London, are two of the more important private developments in Great Britain, with about 50,000 and 25,000 workers, respectively. In recent years, the British Government has undertaken to build additional industrial districts, financed by a combination of public and private capital. Special inducements are offered for small companies that are just starting production.

Relation of Industry to Residential Locations

Industries are attaching increasing importance to the need for good homes for their employees. Planning new industrial districts must therefore go hand in hand with the development of residential neighborhoods. This relationship has often been neglected in America and abroad. The trend of industry toward locations in the environs of large cities further emphasizes the need for homes easily accessible to these new manufacturing plants. Under ideal conditions, the majority of employees would be able to walk to work. When this cannot be achieved, the distance should be only a short trip by bus, trolley or automobile. Time and money spent in travelling long miles to and fro is even more burdensome for the industrial employee than for the office worker. These residential neighborhoods should be planned for the families of workers in a variety of industries. They can thus enjoy a greater breadth of friendly relations than is possible in the "one-industry town."

It is wise to caution against building homes in the shadow of factories where noise, odors and smoke make good living impossible. Recent zoning provisions in some cities wisely prohibit the construction of residences in areas set aside for heavy industry.

Effective land use planning can do much to assure that the right buildings are located in the right places. Work and workers are mutually interdependent. Both are entitled to the fullest consideration when designing places to work and places to live, and relating these two essentials of urban life to each other.

MOVEMENT OF GOODS

Port Facilities

From earliest times port cities have grown not only as locations for the transfer and shipping of merchandise but also as logical manufacturing centers. Local products can usually be distributed more cheaply through the local port than by rail connection to other seaboard points. The main essentials for a successful ocean port are: availability of import and export cargo; good railroad and highway transportation; modern piers, warehouses and handling equipment; frequent sailings to principal overseas destinations; and an efficient labor supply.

Ocean-going freight line operators will usually send their ships as far inland as possible via river, canal and lake, provided they can obtain a return cargo for export. This is also an advantage to the manufacturer and shipper as water-borne freight rates are lower than rail charges. Inland water transportation accounts for the prosperity, for example, of the Port of Houston, Texas, which is situated on a canal, 30 miles from the Gulf of Mexico. It has become one of the largest oil shipping ports in the world and its ocean commerce, in effect, by-passes the natural harbor of Galveston on the coast.

Port of Oakland, California . . . . Across the harbor from San Francisco. *Clyde Sunderland, Oakland, Califo*

The Port of Albany, nearly 150 miles up the Hudson River from the sea, has developed for the same reason, though it faces the constant competition of New York.

A good port is so vital to the industrial growth of a region that many cities have taken aggressive steps to build artificial harbors when nature failed to provide them. Los Angeles constructed a man-made harbor and, in terms of annual tonnage, now far outranks San Francisco which has one of the finest natural harbors in the world.

As with industrial planning, good port planning requires expert attention to factors that promote efficiency. Speed of ship turnaround — unloading and loading — depends on the physical facilities of the docks and terminals. Antiquated piers, lack of heavy cranes, congested storage and handling space must be corrected if a port is to maintain and improve its competitive position. Access by highway is equally essential because of the increasing proportion of freight transported by motor truck. Traffic congestion can choke the prosperity of a port as easily as it does a downtown business center.

Piers and related port facilities were formerly owned principally by shipping lines and railroads. The investment required for a modern port has become so great, and the necessity for its efficiency so urgent to the welfare of the entire community, that the present trend is toward public ownership.

Fairchild Aerial Surveys, Inc.

South Brooklyn Waterfront, New York City . . . . The Bush Terminal buildings are in left center.

Port of Houston, Texas . . . . Ocean-going vessels are tied up along the banks of the canal that leads to the Gulf of Mexico. *Robert L. Browning, Texas City*

Port of Los Angeles *Board of Harbor Commissioners, Los Angeles*

Rail Freight

It has been shown how most large cities developed in their early years as ports for water-borne commerce, although a few owe their original growth almost entirely to the railroads. Today every city is dependent, in greater or less degree, upon rail transportation for food and raw materials and for shipment of its manufactured products. Most people are far more familiar with railroad passenger service, with its de luxe trains and monumental terminals, than with the more lowly freight trains and stations. Their actual relative importance may be gauged by the fact that in 1946 the principal American railroads derived only 16.5 per cent of their combined gross revenues from passenger operations.

The pattern of railroad tracks crosses and criss-crosses our urban regions. It has been a basic factor in determining which areas would be used for industry, for residential development and for recreation. The rail network and the railroad yards, in effect, fixed the layout of many of our cities for us, and limited the directions and areas of expansion. Though the result would have been better if the railroads had been more carefully planned, we must now generally accept the existing pattern, inasmuch as railroad relocation is a very difficult and costly process.

The removal of rail freight yards from central to outlying locations can sometimes be achieved. These yards were usually built on what was originally the "edge of town", but have now been engulfed by the spread of metropolitan growth. Their sites may now be very valuable property, and also may be too small for today's volume of freight traffic. In such cases, a railroad may well decide to buy a new site. The old yard can then be sold profitably for residential use, or for some other type of private or public redevelopment that is more appropriate to its location in the inner framework of the city. In Boston, for example, some of the office buildings in the Park Square district occupy a former railroad yard. Opportunities of this kind also exist in Chicago and many other "railroad towns" that have experienced rapid growth.

In its effect upon the future of cities, the most important railroad development of our century is electrification. This relieves whole neighborhoods of blight from the smoke of steam locomotives; and, even more significant, makes it possible to place rail

New Haven Railroad

Transferring Rail Freight to Trucks.

New Haven Railroa

Icing a Refrigerator Car.

lines and yards underground in central urban areas. Sections of the Henry Hudson Parkway in New York were built over the New York Central's west side freight tracks and yards, after train operation was completely electrified. The apartments and hotels that line both sides of New York's Park Avenue stand on steel stilts above the railroad passenger yards north of Grand Central Terminal.

The day when all rail passenger and freight service in cities will be fully electrified is probably far distant, as the cost for overhead power lines is greater than most railroads can afford, and the benefits usually accrue more to the cities than to the railroad companies. Instead of electrification, the present trend is toward greatly increased use of diesel-electric locomotives.[1] They are more efficient and economical for the railroad, and free the city from the smoke and soot of the conventional coal burning steam engines. In Boston and other cities, proposals have been advanced for construction of express highways on open viaducts above railway tracks and yards after diesel-electrification is accomplished.

In metropolitan regions that are served by several railroads, the economical transfer of freight cars from one line to another is extremely important. Delayed deliveries spell increased costs of industrial production and weaken a city's competitive position. To meet this problem, the larger metropolises have belt-line railroads that interconnect the main trunk lines at a distance from the central terminals.

Railroad consolidations can sometimes eliminate unneeded tracks and yards formerly operated on a competitive basis. However, so rigid is the pattern of railway lines and the industries they serve, that few changes can be made without at the same time shifting industrial plants that must continue to have rail connections. In the field of passenger service, on the other hand, some progress has been made in consolidation of the terminal stations of different railroads. By this means, the public convenience is furthered, and valuable land can be released for other uses.

With the increasing volume of goods that is carried to and from the railroad freight stations by motor truck, the construction of well-designed rail-truck interchange terminals has become a necessity in large industrial cities. Loading and unloading of hundreds of trucks a day obviously cannot be done efficiently on public streets outside freight stations. The Port of New York Authority completed its Union Inland Freight Station Number One in 1932. This station covers

[1] A diesel-electric locomotive burns fuel oil in an engine similar to an automobile's. This engine is used to generate electricity, which drives the locomotive.

New Haven Railroad

The platform in a Freight Station.

New Haven Railroad

Rail Freight Handling . . . . loading a freight car.

an entire block in Manhattan. The freight cars and motor trucks are loaded and unloaded inside the building. Nearly 200,000 tons of package freight are handled each year, with substantial savings in time and money to shippers, and complete freedom from street traffic congestion.

It is also good practice to construct special terminals designed for large trucks engaged in long-haul business. These terminals are used to transfer merchandise to and from smaller trucks that can more readily handle delivery and pick-up service in congested business districts. Two such terminals, one in Newark, New Jersey, and the other near the Holland Tunnel portal in Manhattan, are now under construction by the Port of New York Authority. Similar projects have been recommended by the Boston City Planning Board.

Need of Coordinated Transportation

The port, the railroad network and the highway system together constitute the framework for the industrial growth and prosperity of most large cities. Movement of freight by air is now on the threshold of an important future, and the airport is becoming another vital factor in the industrial pattern. All these elements are so closely inter-related that it is manifest that no sound solution of their major problems can be achieved without coordinated planning and action.

Facilities that were adequate for the needs of a previous generation cannot meet the demands of modern competition. Better facilities must assuredly be built to keep pace with the times. Only those cities and regions that act swiftly can look to the future with high confidence.

The Port of New York Authority

Port of New York Authority Building . . . . Union Inland Freight Station Number One.

VI.

AIRPORTS, PUBLIC BUILDINGS, AND UTILITY SERVICES

PLANNING FOR TOMORROW'S AIR TRAVEL

Growth of Air Transportation

From its inception in 1927, American commercial aviation has grown far beyond the most optimistic expectations of informed officials. In 1947, its passenger volume reached the phenomenal total of 15,000,000 — about half as many persons as were carried by all the railroad Pullman cars in the nation. Most of the traffic increase has taken place since the close of World War II. In 1941, the passenger volume was only a little more than 4,000,000 with about 350 airplanes in service. In October, 1947 there were 930 airplanes in American domestic and foreign commercial service. The newer types have over twice the passenger capacity of the 1941 models. It is authoritatively predicted that commercial aviation will exceed 100,000,000 passengers per year by 1950 and will reach nearly 200,000,000 ten years later. The Port of New York Authority has estimated that New York City's airports alone will handle nearly 32,000,000 passengers in 1960. As for air freight and air express, they are still in their infancy. Their future is assured. They are growing so fast that their eventual tonnage cannot even be predicted.

Manufacture of the smaller types of airplanes for private flying is also an infant industry. It would be unrealistic to compare it with the automobile industry, which grew in half a century to very nearly 35,000,000 vehicles — one for every four persons in the

A Small Airport

Clyde Sunderland, Oakland, California

Oakland Municipal Airport . . . . Plan for development on an eventual site of 2400 acres. Note Golden Gate and Oakland Bridges at top left.

Civil Aeronautics Administration

Washington National Airport

United States. Perhaps in another 50 years we may have 5,000,000 airplanes of all civilian types, as compared with fewer than 100,000 in 1947. There may be many more, or many less, depending on the popular favor of new designs not yet envisaged.

The Airport Site Problem

Clearly, the airplane has arrived as an important means of modern transportation. But the airplane is valueless without airports. The railroad came to the American city before it grew large and congested, when there was seldom any problem of finding land for terminals and yards. By contrast, the airplane developed after the city attained most of its growth, and consequently, finding well-situated land for airports is extremely difficult.

Some cities, notably New York and Boston, have been able to create airports by reclaiming tidal marshes or filling in shallow water. Other cities, like Pittsburgh, sheared off hill tops. Still others — and these are in the majority — utilized vacant flat land; but too often the nearest available land was five to 15 miles from the center of the city. Such locations can only be reached by driving on heavily travelled streets. It is reported that the average round-trip time from the centers of American cities to their airports is one hour and twenty minutes. An automobile ride of 12 miles to an airport, taking 40 minutes in traffic, is the equivalent of nearly 200 additional miles of flying. Many passengers actually find that it takes them longer to get from their office to the airport than it would to fly between the airports of New York and Washington. Those large cities that cannot obtain major airport sites reasonably near their downtown centers are faced with the need for building expensive express highways to shorten travel time.

Features of New Major Airports

Most airports are now congested by their present traffic volumes, and are entirely inadequate for the prospective growth of the next few years. The federal government, the cities, and the airlines are aware of this critical condition and are taking drastic steps to catch up with present and future demands. Experience has also brought knowledge of deficiencies in planning and

La Guardia Airport, New York

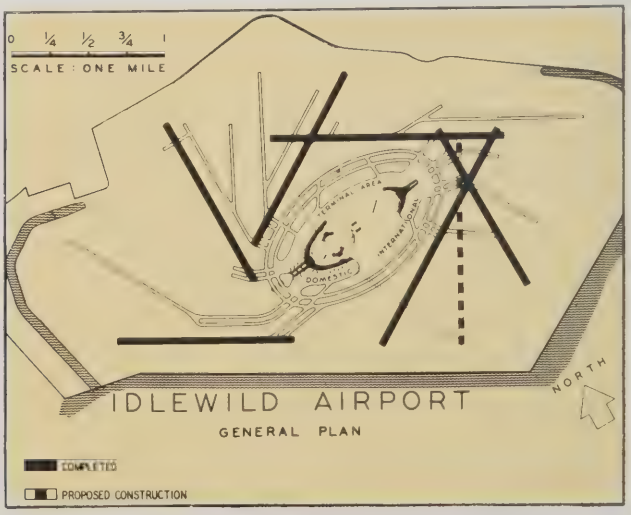
American Airlines, Inc.

layout that were not foreseen when the present major airports were built during the last 15 years. The newest airports in the environs of a great many of our foremost cities are large enough in area to give space for additional runways in the future, parallel to those now being constructed. They will eventually have terminal facilities for loading or unloading 100 or more airplanes simultaneously, or over 2500 planes per day, involving 100,000 passengers and visitors. With such volumes of traffic, particular attention must be given to insuring efficient interchange of passengers between airplanes, automobiles, buses and other means of transportation.

The New York International Airport (Idlewild) on Jamaica Bay, has an area of more than 5,000 acres—approximately eight square miles. Its terminal area alone will spread over 160 acres — equivalent to a square measuring one-half mile on a side. The new domestic terminal building will be ten times as large as the present structure at La Guardia Field. In its first stage of development, 42 loading stations are to be provided, which is sufficient to handle 120 planes per peak hour. This great airport is designed for 12 runways, of which seven are included in the present construction program.

Though less extensive, Logan Airport at Boston is also representative of forward-looking design for future needs. Its area is to be 2000 acres, sufficient for six runways, of which four are completed or under construction. In 1946, Logan handled about 1,000,000 passengers, which was one-quarter the total for the airports serving New York City.

It is anticipated that major airports can be made self-supporting by a combination of airplane landing fees, sales of gasoline, observation platform admissions, and profits from a great variety of concessions. These



The Port of New York Authority

New York International Airport

American Airlines, Inc.

Airplane Baggage Handling . . . . A travelling belt does the job.

American Airlines, Inc

Douglas DC-6 . . . . Capacity: 52 passengers.

concessions might include lunch rooms, restaurants, night clubs, hotels, moving picture theaters, exhibit halls, retail stores of many kinds, parking spaces, and even swimming pools.

Number and Type of Airports

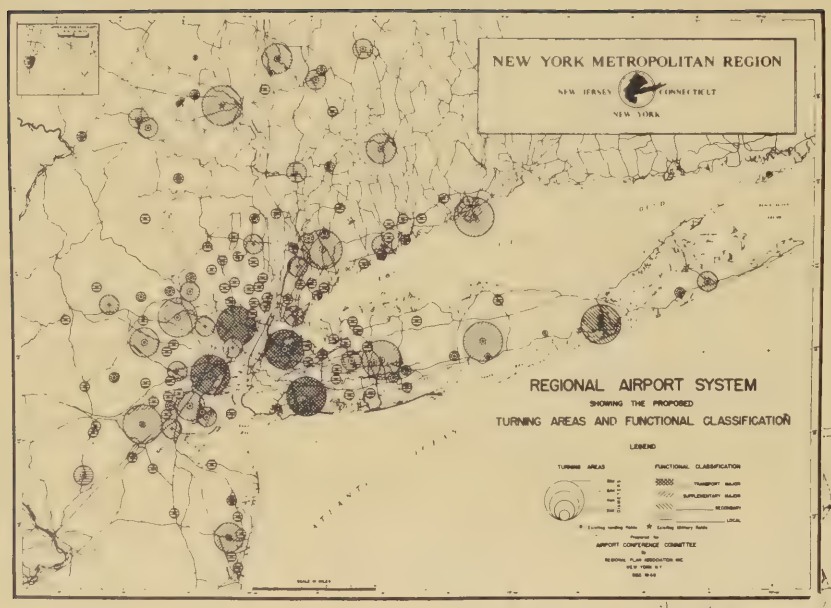
It is now recognized that private, military and commercial flying should each have separate fields. Their combination creates operational difficulties and hazards. Separation has not yet been effected but progress is being made. In the future, it may well be that air freight, express and mail will need to be similarly severed from commercial passenger service.

The total number of certified airports in the United States almost tripled from 1930 to July 1947, increasing from 1,782 to 5,337. In 1945, the Civil Aeronautics Administration in Washington recommended that during the succeeding 10 years we should build an additional 3,050 airports and also make substantial improvements to 1,625 of our existing fields. Much of this work has already been accomplished.

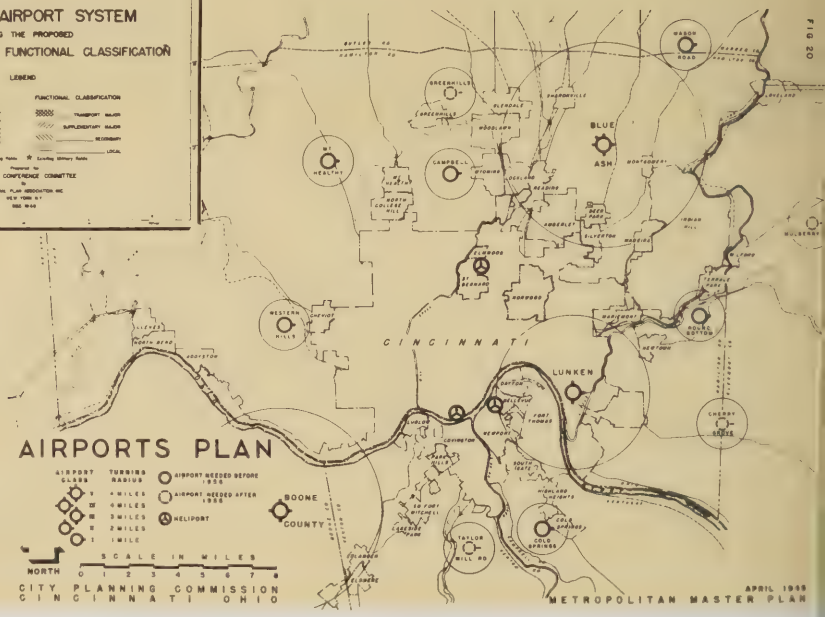
Airports, of course, are of many types and sizes, ranging from grass-covered landing fields of a few acres, suitable only for limited private flying, to vast international terminals with many miles of paved runways capable of carrying airplanes of 75 and even 100 tons.[1] Military fields are being designed for future plane loads of 150 tons. It is one of the functions of the Civil Aeronautics Administration to classify airfields and certify the adequacy of their facilities for particular kinds of service. Of the 6,669 municipalities in the United States with over 1000 inhabitants, only 2,578 — a little over one-third — have classified airfields. It is nevertheless significant of the progress that has been made that nearly 60 per cent of the entire population of the United States now lives within 25 miles of a commercial airline stop.

Technical progress in helicopter design makes it virtually certain that cities will need to arrange for roof-top landing areas in their downtown centers. It is generally anticipated that the helicopter will have particular application as a taxi from main business districts to commercial airports; and as a service for short interurban runs. Its use for long transport flights, as a substi-

[1] The B-29 Army "Superfortress" weighs 67½ tons with full load and the Constellation weighs 45 tons.



Airport Plan for New York Region

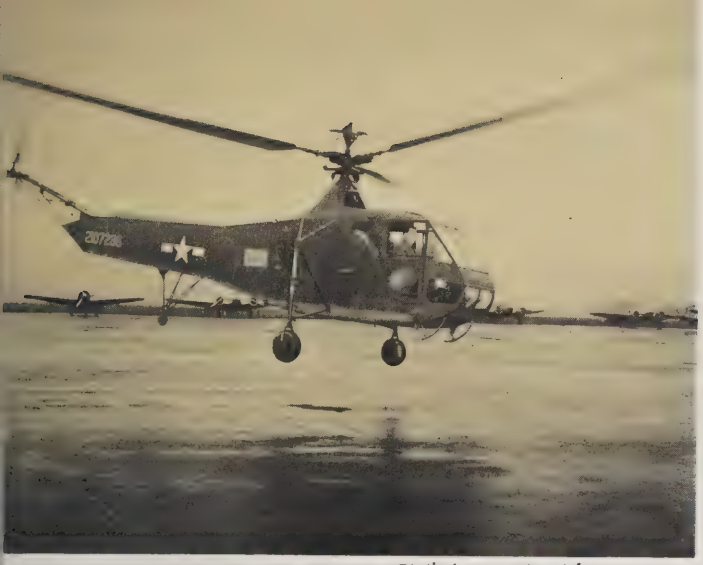


Airport Plan for Cincinnati Region . . . . Showing planned distribution of existing and proposed airports. Note provision for three "heliports" for helicopter service.

tute for other types of aircraft, including jet-propelled planes, is not considered probable. In the light of all present knowledge and trends, it would be rash folly to refrain from planning and building large airports with long runways, merely in the hope that the helicopter might make their great size and cost unnecessary.

Planning the Distribution of Regional Airfields

The growth of both commercial and private flying brings home the necessity for determining now upon sites for future airfields of all classifications, from the smallest to the largest. In urban regions, it is already difficult to find and acquire sufficiently large tracts of land. If steps toward acquisition are not taken very soon, it will be too late. In recognition of this urgency, many major metropolitan areas have already completed regional airport plans, with recommended sites for each of the officially recognized classifications of field. The New York Regional Airport Plan and the plan for the Cincinnati Metropolitan Region are illustrated here. Both provide adequately for predicted increases in commercial and private operations. Similar plans have been prepared for Chicago, Boston, Worcester, Indianapolis and other regions. An important part of these advance studies is the analysis of the close relationship between air, rail, highway and water transport in the entire metropolitan area. In this way airport planning is



Helicopter *Civil Aeronautics Administration*

coordinated with other branches of regional planning.

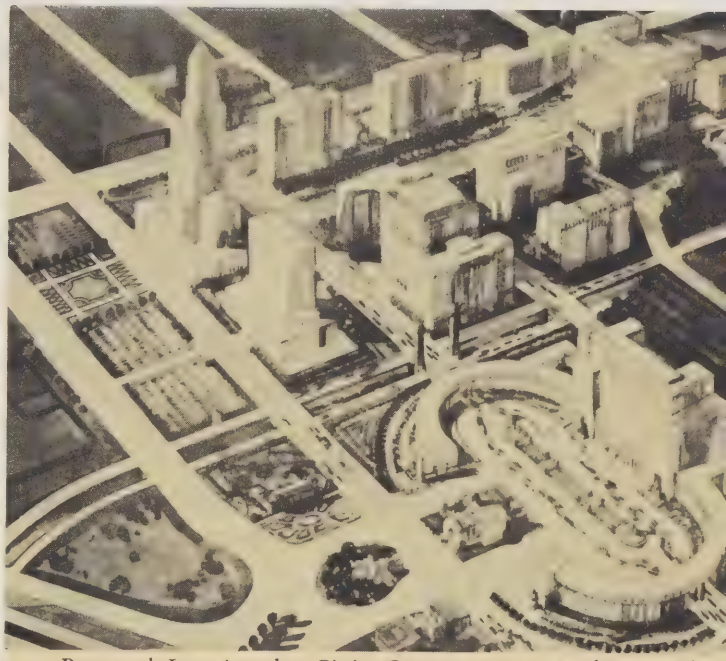
After official approval of such plans, the next step is to obtain the sites, even if development of some of them can be delayed for a good many years. If the land is not secured now, it may be bought up for houses or industries, making the cost of its later acquisition prohibitive, and forcing the selection of other sites that are less advantageously located. The more distant the site from the concentrations of people it is intended to serve, the worse will be our future airport pattern. Every additional mile of ground travel adds to inconvenience, delay and passenger cost.

The United States is increasingly becoming a nation on wings. Development of aircraft was greatly stimulated and accelerated by both World Wars. Now, we enter the Age of Aviation. Its full fruition cannot be foreseen. But even in these early years of peace, we can clearly see the need for far more airports, both large and small. And we can understand that planning for these airports, and acquiring their sites, are this year's order of business, in preparation for the years to come.

PUBLIC BUILDINGS AND CIVIC CENTERS

Influence of the Chicago World's Fair

In the early years of the 20th Century, there was a widespread movement for the construction of municipal civic centers. It was recognized that the city hall, court



Proposed Los Angeles Civic Center . . . . Architectural sketch showing existing and future buildings. Structure with tower is the City Hall. Proposed County Court House is in foreground. *Los Angeles City Planning Commission*

Keystone View Co., N.Y.

New York's Civic Center . . . . State Supreme Court, U.S. Court House, and Municipal Building. Other important buildings do not show. →

Downtown Cleveland . . . . Tower of Union Railroad Terminal rises above the Civic Center buildings, which surround the open plaza in right background. →

Cragg, Cleveland News

house, library, post office, auditorium and other important public buildings should be arranged in an effective and uniform architectural group, affording both beauty and governmental efficiency. This movement was stimulated by the public acclaim accorded the spacious site design and splendid classic architecture of the Chicago World's Fair in 1893.

Civic Centers — Present and Future

Unfortunately, most of the plans prepared in response to the public desire for beauty were too grandiose. They were beyond the financial capacity of the taxpayers and could not be carried out. In some few notable instances, cities adhered to an original civic center plan and gradually erected new buildings through the years as funds became available. Among the finest civic centers in the country are those of San Francisco, Cleveland and Denver. An outstanding example in New England is the small well-designed municipal group at Springfield, Massachusetts.

Most American cities either failed to carry out earlier plans for a civic center, or did not prepare any plans at all. Consequently, we find their public buildings scattered at random rather than grouped together. There is usually no physical relation between the

Civic Center at Springfield, Mass. . . . . An effective grouping of public buildings. *Don White, Springfield, Mass.*

San Francisco's Civic Center . . . . Central building with dome is the City Hall. The 1945 United Nations Conference was held in the Opera House and Veterans Memorial Building, at left of City Hall. *Gabriel Moulin, San Francisco*

Denver's Civic Center . . . . State Capitol at right dominates the plaza around which public buildings are grouped.

Denver Planning Commission

various buildings; they lack unity and harmony of architectural style; and their sites and settings are neither adequate nor imposing. Many such buildings are now obsolete, and too small for present and future needs. They are going to have to be replaced. And many downtown areas are occupied by worn-out offices, factories and tenements. These also must be replaced. The hope for the future is that the redevelopment of a downtown area will include the creation of a new civic center.

"Hope," without *action,* is an idle word. To achieve results, it is necessary to have popular support for a practical and economical plan. All needed land for a civic center must be acquired at one time; but the buildings can be erected one by one over a considerable term of years.

Neighborhood Centers

Of almost equal importance, is the selection of local civic center sites for police and fire stations, libraries, schools, and health clinics to serve the needs of neighborhoods. These should fit into a community center plan which, on a smaller scale, can create the same degree of beauty and harmony as the impressive grouping of government buildings in the main civic center.

PUBLIC UTILITIES AND SERVICES

Under this broad heading we include water supply; sewerage systems with their disposal plants; electricity; gas; and telephone.

Advance planning for all of these is directly determined by estimates of future population. It is therefore desirable that the public agencies and private corporations concerned should pool their knowledge of population trends. They can thus help each other to reach agreed figures for the probable "market" that they will serve in their separate fields. An official planning board can perform a most useful function by bringing together the technical representatives of all principal utilities and services.

Utilities — Private and Public Ownership

The private corporations that furnish electricity, gas, and the telephone can be fully relied upon to plan adequately for future population requirements. It is only in most unusual circumstances, as during and after World War II when new construction was curtailed, that public demand will place a strain upon the capacity of these services.

Hoover Dam *U.S. Bureau of Reclamation*

Some municipalities — mostly small cities and towns — own and operate public electric light and power stations, and sell the current in the same way that the private utilities do. A little over four per cent[1] of all electricity generated in the United States is produced by municipal plants. Two of the most important of these are in Seattle and Cleveland.

Water Supply

Early water supplies were provided by private corporations financed by private capital. They built reservoirs or sunk artesian wells, constructed water mains, and sold their water to the public. As cities and urban regions increased in population, nearby sources of water became hopelessly inadequate, and these private corporations were unable to finance the great cost of tapping distant watersheds. Water supply has consequently become principally a governmental function, although many private companies still exist and continue to serve limited areas. Reservoirs and aqueducts are more economical when built on a large scale to supply groups of municipalities. We therefore have *joint water boards*, so as to supply a quality and quantity of water that few towns could provide if they acted alone.

Only municipalities situated on big lakes or rivers are secure in the possession of an unlimited supply of fresh water. Even these cities must expend large sums for filtration and purification plants. Urban regions not so fortunately located have faced a long and painful struggle between the growth of population and the shortage of available water. Water — to drink, for the household, for industry — is a potentially limiting factor on the number of people that can safely and prosperously live in a city or region.

The growth of New York has been dependent upon the pioneering work that built the great Croton water system in Westchester County; then tapped the Catskill supply in the mountains west of the Hudson; and now is drawing upon the upper reaches of the Delaware River. The city has been forehanded. It has consistently done such planning and construction in advance, so that no water shortage emergency has occurred in recent generations.

Sewage Disposal

Sewerage systems used to be built sometimes by private enterprise. Now they are invariably a function of government and are financed by taxes and assessments upon real estate. They are essential to the public health; but they are costly to construct and lack the popular appeal of a great park or imposing school building. Hence provision of new and larger sewers and modern sewage treatment plants too often lags behind the dictates of good public health practice. Deficiencies are often not corrected until conditions become so serious that a public emergency is imminent.

Cities located on the ocean or on large rivers or lakes have traditionally discharged their raw untreated sewage into these bodies of water. With the phenomenal growth of urban population, this has resulted in a serious pollution problem. Fish life is killed; bathing beaches are rendered unsafe; and in the case of river towns, the sewage may pollute the only available fresh water supply of other cities farther down stream. By various types of filtration, settlement, and chemical action, raw sewage can be rendered harmless. A proper treatment plant and

[1] Derived from figures given in Statistical Abstract of the United States, 1946, Table 530. This percentage *excludes* federal and other non-municipal public plants, which account for another 15 per cent of the national output of electricity.

trunk sewer system, however, is an expensive investment for a small town. The trend is therefore toward *joint sewerage systems* for many cities and towns in the same region. These are financed by creation of special tax districts, with power to raise revenue from the taxable property served. They constitute the earliest examples of joint municipal enterprise and metropolitan government.

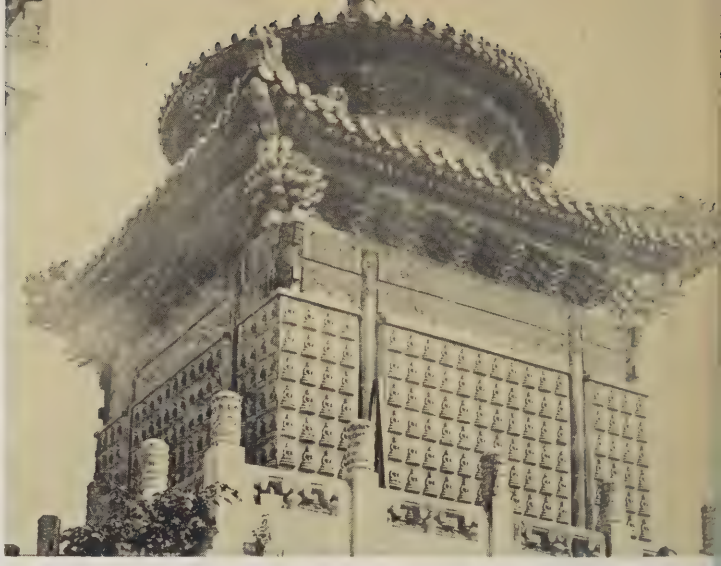
Civil Aeronautics Administration

Consolidated Vultee Airplane . . . . Capacity: 204 passengers. The length of this plane is 182 feet — more than half the length of a football gridiron.

Civil Aeronautics Administration

Boeing C-97 . . . . Capacity: over 100 passengers.

The Famous Marble Boat, Peiping . . . . This is outside the city, at the Summer Palace of the former emperors. *Keystone View Co., N.Y.*



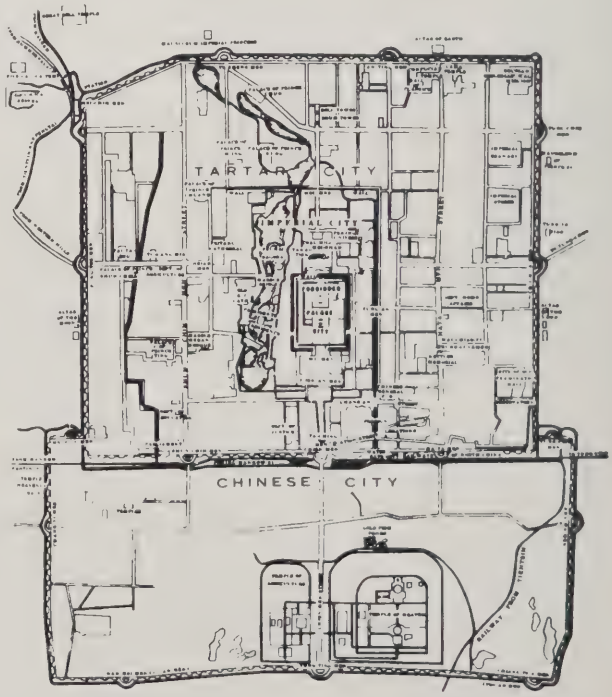
Imperial Temple, Peiping *Keystone View Co., N.Y.*

VII.
FOUR OUTSTANDING CITY PLANS

Throughout the preceding chapters, we have stressed the importance of advance planning in making our cities better places for living. Three great cities, Peiping, Washington and Paris, are graphic examples of the benefits to be derived from such planning. Another metropolis, London — plagued throughout its history by all the ills of disorganized growth and face to face with the appalling destruction wrought in World War II — has now adopted an exceptionally far-sighted plan for the needs of its future.

Peiping

Peiping (Peking) is one of the comparatively new cities of China. It is situated on a wide plain, about 100 miles inland from the coast, and has no river or canal to aid its commerce. It was originally laid out as a military encampment by Kubla Khan in 1262. In 1409, Yung Lo, second emperor of the Ming dynasty, transferred the national capital from Nanking to Peiping where he proceeded to build a magnificent city, following detailed plans prepared by a Taoist monk. The main streets are wide and straight and form a rectangular pattern of "super-blocks", as clearly shown in the accompanying illustration. These super-blocks enclose a secondary system of narrow irregular roads.



Plan of Peiping . . . . This drawing shows only the major streets.

Keystone View Co., N.Y.

Typical Mud Hut Colony in China

Philip D. Gendreau, N.Y.

Hauling Merchandise in China

Peiping is noted for its beautiful palaces and temples, for its massive walls with their imposing gates, and for the broad open areas and long vistas that combine to give it a remarkable feeling of spaciousness. It is a city of walls within walls. At the core is the "Forbidden" City, where the palace buildings are surmounted by roofs of golden orange tile. This lies inside the Imperial City, which in turn is surrounded by the Tartar (Manchu) City. Then adjacent to the south, is the walled Chinese City. These relative locations are made clear by the accompanying plan. Peiping is beyond question one of the most beautiful cities in the world and one of the most logical and orderly in its layout. It continued as the capital of China until 1927, when General Chiang K'ai-shek re-established Nanking as the seat of government.

Paris

Paris originally had no formal street plan and the city grew with all the tortuous irregularities common to typical medieval towns. At three periods in its history, however, it has been systematically replanned, extended and partially rebuilt, so as to achieve a basic framework of orderliness for its street system. The narrow minor streets still remain to give an informal charm that supplements the stateliness and grandeur of the main avenues.

During the long reign of Louis XIV (1643-1715) great architects, including Colbert, Le Nôtre and Blondel, laid out beautiful parks and long stretches of boulevard in open fields outside the old city of Paris. The Place de la Concorde — one of

Screen Traveler, from Philip D. Gendreau, N.Y.

Place de la Concorde, Paris . . . . A great plaza with beautiful fountains and the famous Egyptian obelisk in its center. This is the site of the guillotine of the French Revolution.

Screen Traveler, from Philip D. Gendreau, N.Y.

Arc de Triomphe, Paris . . . . Looking along the Champs Elysées.

the largest open squares in the world — and the Avenue des Champs Elysées leading out of it, belong to this period. They were planned decades in advance of their construction.

In the early years of the 19th Century, Napoleon Bonaparte added to the imposing glory of Paris by erecting great commemorative monuments, including the Vendome Column, the Arc de Triomphe and the Arc

View of Paris from the Eiffel Tower. *Philip D. Gendreau, N.Y.*

Place de l'Opéra, Paris. *Philip D. Gendreau, N.Y.*

Acme Newspictures Inc.

Paris — Planned in the Grand Manner . . . . Boulevards radiate from the Arc de Triomphe, like spokes of a giant wheel.

du Carrousel. He also was responsible for rebuilding the Rue de Rivoli and the Rue de la Paix, with long facades of uniform architectural design.

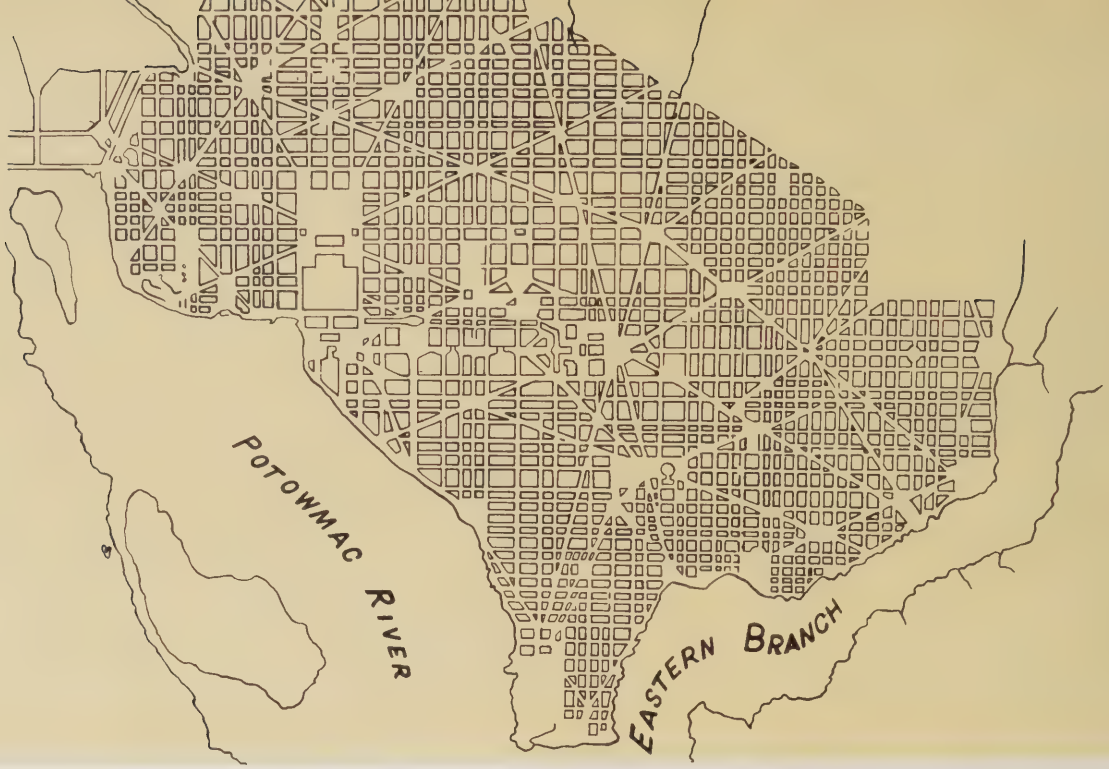
In 1853, Napoleon III commissioned Baron Georges Eugene Haussmann, his Prefect of the Seine, to provide adequate traffic routes. Haussmann accomplished this by slashing wide new boulevards through the city, leaving large open squares or circles at their junction points. He also built a system of arterial roads leading from Paris into the open country. The results of his work are shown on the adjacent sketch map.

Paris, like Peiping, is a city of long vistas, great architecture and generous open spaces. But also, as in Peiping, one can easily get lost in a maze of ancient streets flanked by crowded houses whenever one turns away from the main avenues. Paris is a city of contrasts. It teaches the lesson of the remarkable improvements that can be accomplished by planning even in an old city, but also emphasizes how much has still been left undone.

Philip D. Gendreau, N.Y.

The Rue de Rivoli, Paris . . . .Tuileries Palace and gardens on the right. Note arcaded sidewalk and uniform facades of the buildings at left — a remarkable example of fine architectural design.

Plan of Paris . . . . Street Improvements carried out by Baron Haussmann are indicated by heavy black lines.



L'Enfant's Plan of Washington, D.C.

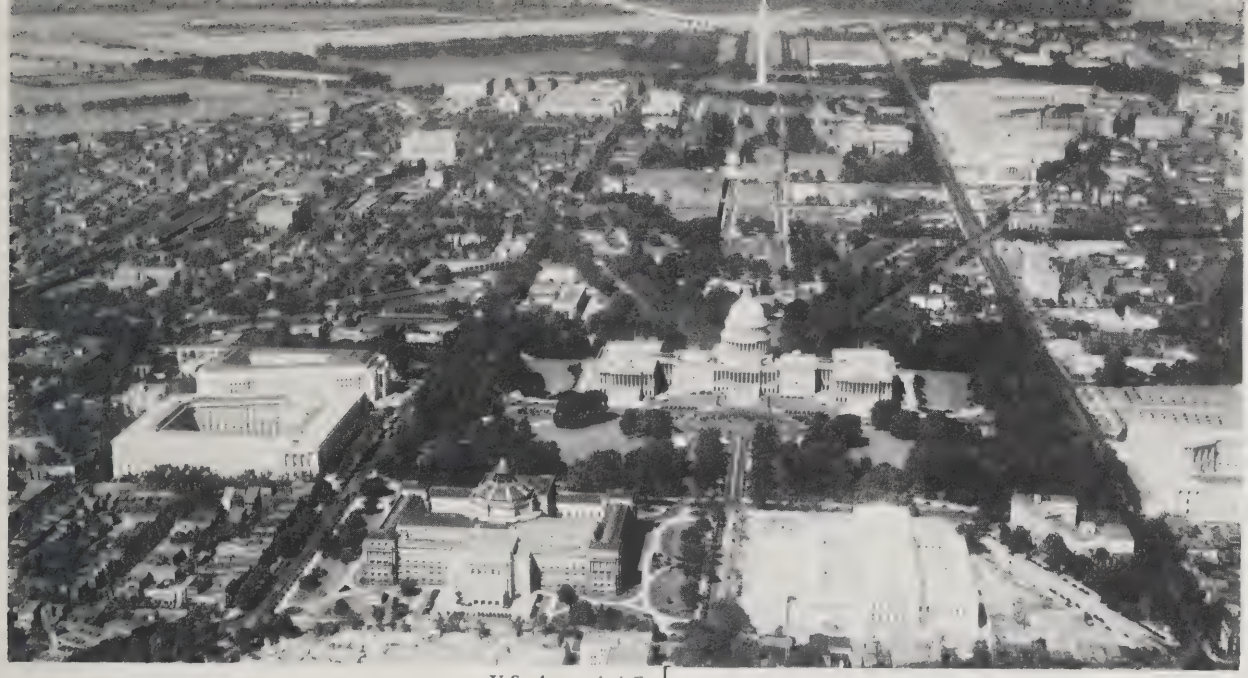
Washington

The most famous city plan in America is that of Washington. It was drawn up for President George Washington by Major Peter Charles L'Enfant, a brilliant young French engineer. This comprehensive plan, prepared in its entirety before any of the city was built, provides a series of diagonal avenues superimposed on a rectangular street pattern. The broad avenues intersect at circles and squares reminiscent of Paris. Dominating the plan are the Capitol, the Mall, and the White House.

With some exceptions, the plan of L'Enfant has been carried out. But as Washington grew, it spread into the open country — far beyond the limits of the original layout. After a number of somewhat haphazard efforts, Congress appointed a commission which adapted the original plan to the entire District of Columbia.

The plan of Washington, with its many wide streets and broad diagonal avenues, makes it relatively easy for vehicles to travel a reasonably direct route between any principal points. However, even this exceptional street system cannot cope with present day volumes of traffic. Special traffic light systems have been installed. Tunnels have been built in recent years to carry some of the main arteries under the circles where congestion was worst. But as yet no true express highways without traffic lights have been constructed close to the heart of the downtown center.

Nevertheless, L'Enfant's plan for this beautiful city shows remarkable foresight for its time, and comes closer to meeting the needs of modern traffic circulation than the original plan of any other city. It provides imposing sites for public buildings and a rewarding sense of spaciousness and grace.



U.S. Army A.A.F.

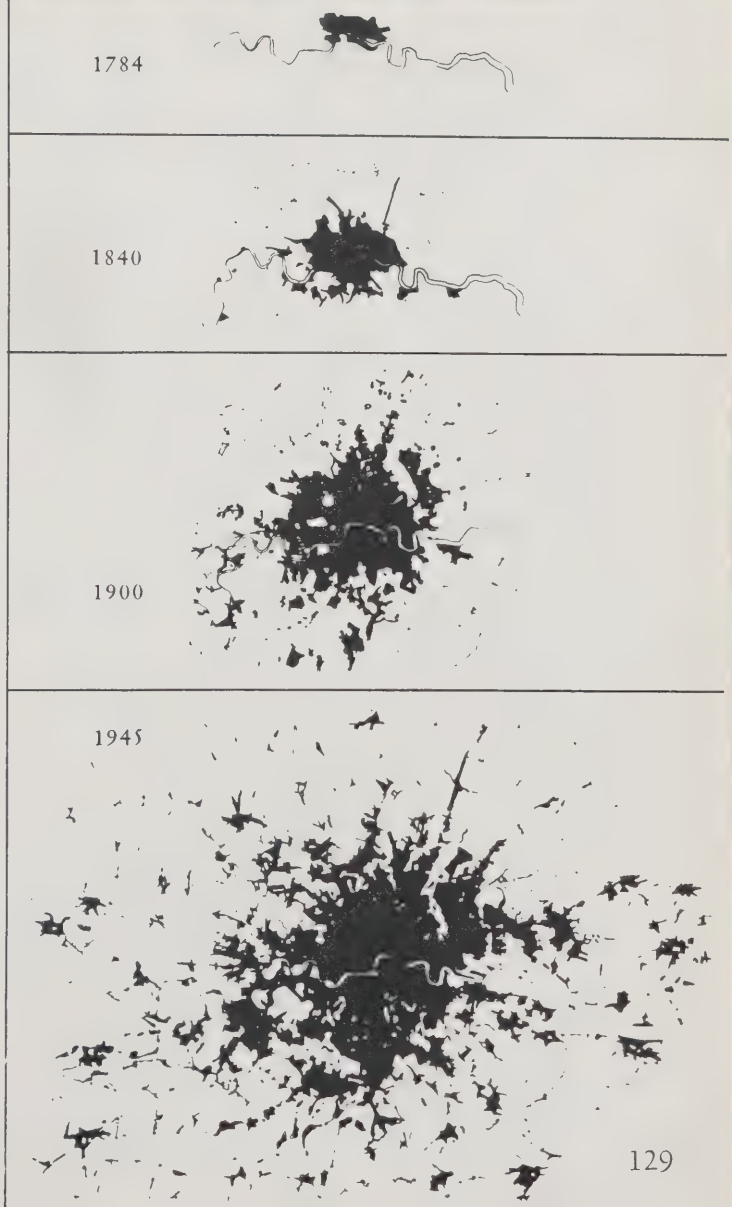
The Capitol and The Mall, Washington . . . . Washington Monument is in background.

London

The original settlement of Londinium on the banks of the Thames was founded by the Romans in 54 B.C., one year after Julius Caesar invaded Britain. It became the hub of a network of Roman roads that were built by succeeding military governors. These roads, originally the symbols of the spread of empire, set a partial framework for London's expansion and have survived virtually unchanged in location even to the present day.

London, one of the few great cities to rise during the Middle Ages, is largely the product of unguided growth. At first there were numerous towns and villages clustered around it. Urban development, however, spread along the old Roman roads, gradually linking town with town in solid lines of buildings arranged in ribbon-like patterns.

In 1666, two-thirds of the corporate area of London proper was swept by the Great Fire and completely destroyed. A rebuilding plan was prepared by the famous architect,



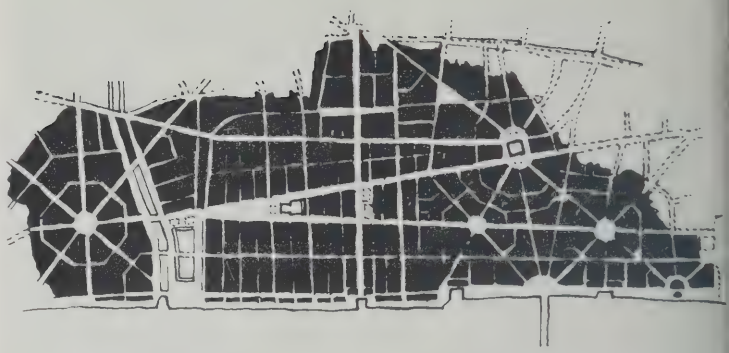
London, Showing Pattern of Growth →

Sir Christopher Wren. Due to dissension and lack of vision, the plan was rejected. With the exception of some street widenings of little importance, this opportunity of centuries was missed, and the old city was rebuilt in its ancient pattern.

Between 1700 and 1820, large sections of the newer area in the western part of London (a long way from the scene of the fire) were carefully laid out and built with great elegance and stateliness. Berkeley Square and Portland Square, for example, have endured as models of orderly urban planning. Toward the close of this period, John Nash designed Regent Street and its buildings, and developed St. James and Regents Parks. Present day London owes much to the achievements of these years. Its serene parks and gardens, imposing squares and monumental buildings give it a distinctive character that cannot fail to impress the visitor.

As London grew in size, its problems multiplied. Without any extensive framework of wide avenues and spacious plazas, the metropolis closed in upon itself and became a solid mass of congested buildings and random streets. By the end of the 19th century, the London region embraced over 6,500,000 people. Still it continued to engulf its suburban towns, filling in the areas between them. Today, the London sprawl covers about 700 square miles — more than twice the area of the City of New York.

The Battle of Britain in 1940, and the V-bombs of 1944-45, destroyed much of the old city and considerable areas of the newer west end. Again, as in 1666, disaster has given London the opportunity to open up new arteries of travel, reduce congestion of buildings, and rebuild in the framework of an orderly plan of development.



Wren's Plan for London . . . . A design for a convenient system of main avenues converging on large public squares and circles.

Philip D. Gendreau, N.Y.

The Strand, London . . . . The Church of St. Clement Danes stands in the center of this famous business street.

Piccadilly Circus, London . . . . A focus of important streets in the heart of the shopping and theater district.

Philip D. Gendreau, N.Y.

Acme Newspictures Inc.

London Traffic Congestion . . . . Westminster Bridge carries a solid stream of one-way traffic across the Thames River.

In 1947 the British government approved a comprehensive plan for Greater London prepared by Sir Patrick Abercrombie. This plan involves resettling some 1,230,000 people from London in new towns that will be built outside the metropolitan area. The first 20 of these, to decentralize London and other overcrowded regions, have already been programmed for construction in 1948-57.[1] The plan also proposes to remedy the lack of open space in London by creating an extensive system of new parks. To provide adequate traffic circulation for the region, a coordinated system of ten radial and two circumferential arterial highways is planned, utilizing both existing and new rights-of-way, and having express features where deemed feasible (see illustration). These will serve as the major framework for a much improved system of secondary and minor streets.

The Greater London Plan is the most comprehensive effort to solve the fundamental problems of a very large region that has ever received official endorsement. After 20 centuries of almost unplanned growth, London is starting to rebuild with all the advantages of modern knowledge and techniques.

The Greater London Plan of 1947 . . . . Main highways are indicated by double black lines. Note pattern of radials, and the inner and outer circumferentials or belt routes. Note similarity to Greater Boston plan illustrated on page 196.

[1] See page 73.

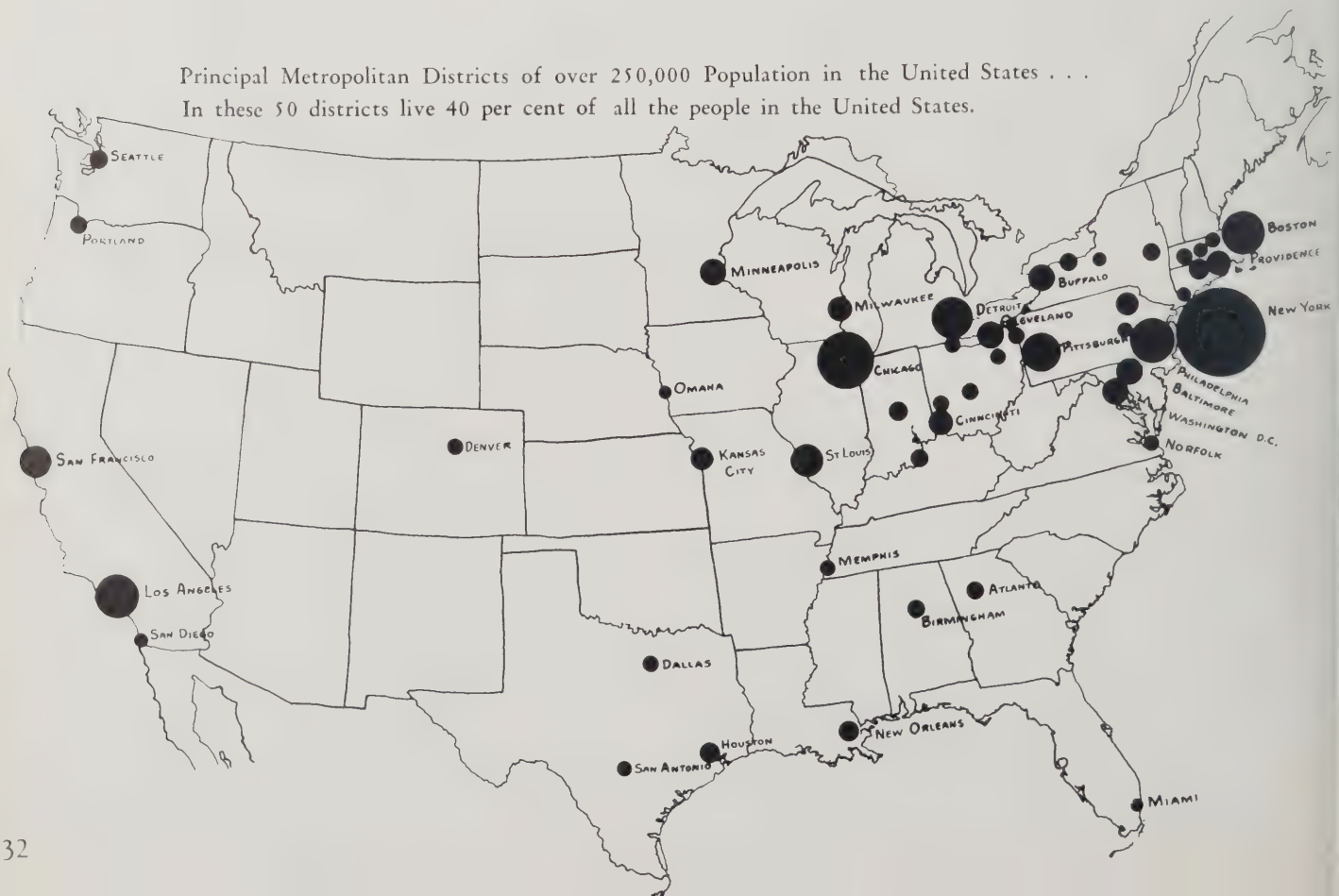
VIII.

IMPORTANCE OF THE REGIONAL PLAN

Need for Regional Planning

We have seen how cities have outgrown their boundaries and become the centers of metropolitan districts. Our major metropolises overflow township, county, state and, in a few instances, such as the Detroit-Windsor region, even national boundaries. Highways, transit, parks and major industrial and residential areas are no longer the problems of one city but concern the whole urban region. Such interlocking of interests makes it apparent that there should be coordinated action by many separate local governments.

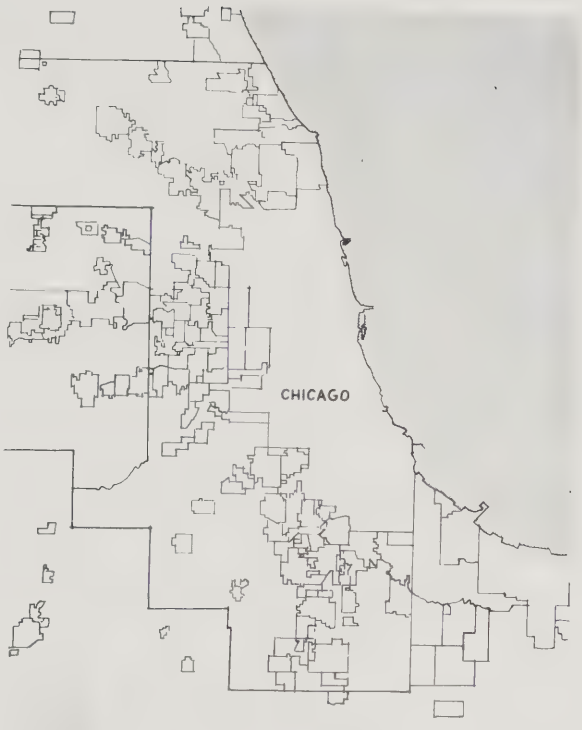
Before seeking to suggest a rational framework for metropolitan planning, let us examine more closely the fantastic complexity of overlapping governmental units in metropolitan regions. The 50 largest regions are spotted on the adjacent map of the United States. The accompanying sketch plans show the local jurisdictions in three of the principal urban regions — New York, Chicago, and Boston. In each case it will be seen that the central city is but a small part of the region for which coordinated planning is needed.



The Greater London Plan area embraces 2,599 square miles of territory and, within its scope, 143 independent local authorities are each empowered to prepare a planning scheme. The London planners, in their report, conclude: "Unless the planning units are enlarged it will be difficult to secure any comprehensive planning. The piecemeal planning of the past will continue with its friction, its overlapping of effort and its neglect of major issues. . . . It would appear desirable to create an authority over the area as a whole . . . to supervise the detailed planning of the area."[1]

An extreme example of overlapping in the United States is the Chicago region, which is governed by more than 1,600 independent administrative units. There is the city at the center; 15 counties; over 200 other cities, towns and villages; 165 townships; and in addition more than 1,000 school districts, 11 sanitary districts, and some 200 other units including drainage districts, a health district and a mosquito abatement district.[2]

Efficiency of local government operation can hardly be expected with such confusion of authority. Services are duplicated. Responsibilities are not clear. Authority is misplaced. State, county, and city programs conflict. It is obvious that much simplification is required. Within this top-heavy structure, the Chicago Regional Planning Association, an unofficial body, has performed an admirable service in securing the cooperation of the many state, county and local agencies, particularly in highway and park planning and in zoning. It would be advantageous also to have an *official* regional planning agency with power to prepare an over-all plan for metropolitan Chicago.



Multiplicity of Local Government Jurisdictions. Chicago Region

Trends in Metropolitan Planning and Government

In the United States there is as yet no example of a unified official government agency responsible for *both* planning and administration of all functions throughout a metropolitan area. The primary trend is not toward one unified metropolitan government, but rather toward a series of separate regional authorities. Their powers are limited to the combined planning and administering of one or several related special functions.

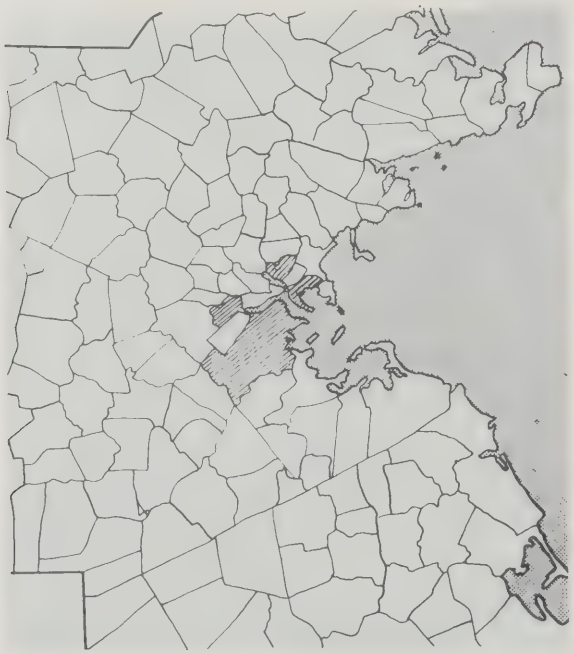
[1] Greater London Plan, by Sir Patrick Abercrombie, 1944, page 183.

[2] Government in the Metropolitan Region of Chicago by Merriam, Parratt and Lepawsky (1933).

The Boston region has probably progressed further than any other in the extent and effectiveness of limited regional services under a single jurisdiction. Forty-three local governments are served for various regional purposes. [1]

A second trend of great importance is the establishment of region-wide official agencies authorized to prepare plans for all types of needed metropolitan improvements, but not possessing administrative authority. The Los Angeles County Planning Commission falls in this category. Nearly all the vast metropolitan area of Los Angeles lies within one county, and the commission has thus been able to do very successful work on a regional basis. It has completed a metropolitan highway plan, a shorefront development plan, and a comprehensive zoning plan. It has also made valuable studies of specific problems such as industrial locations, business centers, and subdivision control. The County Commission and the City Planning Commission cooperate fully on problems in which they have a common interest.

Multiplicity of Local Government Jurisdictions. Boston Region



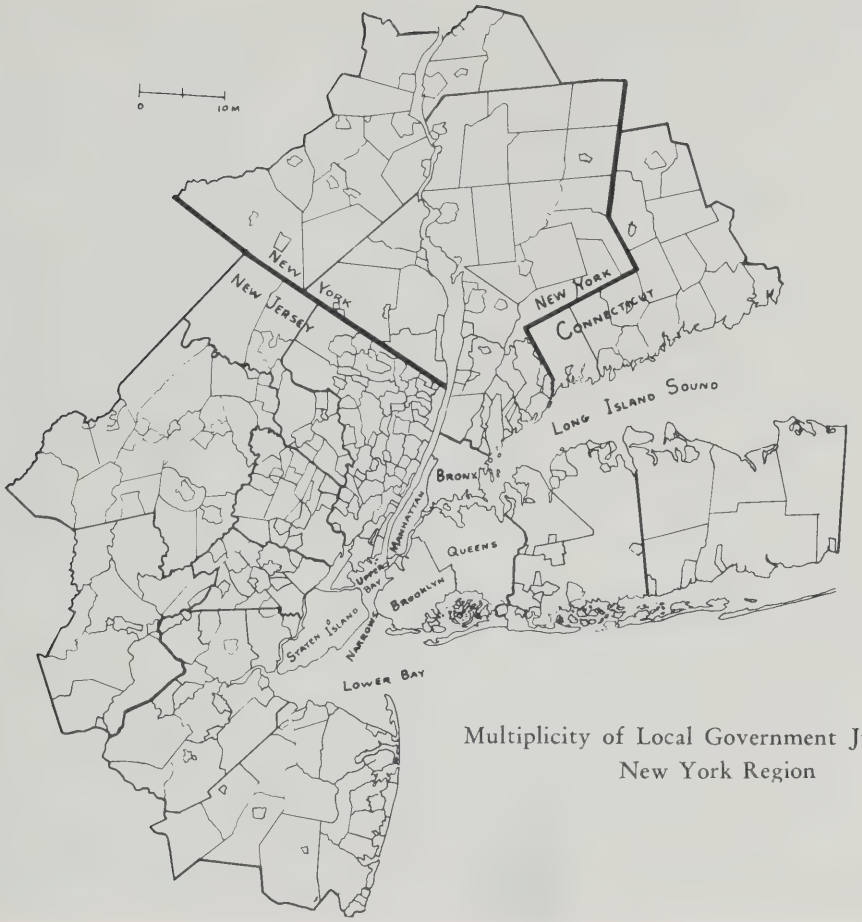
A third type of planning organization — the purely private committee — exists in some 15 urban regions. Such committees undertake, in greater or less degree, comprehensive planning for the solution of metropolitan problems. These organizations have no official status or powers. One of them, the New York Regional Planning Association, logically extends its studies over an area embracing New York City, and part or all of 17 counties outside the city, with over 400 different municipalities, most of which lie within a 50-mile radius. Since the New York region is divided among three states, the actual establishment of a single official metropolitan planning agency would require enactment of special legislation by each of the states concerned.

The Functional Basis for Regional Planning and Administration

It is manifestly easier to describe the difficulties that stand in the way of effective regional planning and administration than to develop a solution for them. Perhaps the best policy is to consolidate the making of all regional plans in a single official planning agency; and to have a limited number of separate administrative authorities carry out these plans.

As pointed out before, automobile, bus and truck traffic is a regional problem. Traffic moves over state highways, along city, town and village streets, through county

[1] See page 256 ff.



Multiplicity of Local Government Jurisdictions.
New York Region

parks and forest preserves, ignoring political boundary lines. It is obviously unsound to permit each independent local government to design and build its little strips of main highway according to its own particular standards of road width and design. These standards would naturally vary from town to town. Such an illogical patchwork method used to be customary practice, but in the present day of high speed superhighways, it has given way to coordinated regional design, regardless of what particular governmental authorities do the construction.

Traffic is only one of the many problems that require regional planning and administration to work out the best solutions. Water supply and sewage disposal are also most effectively provided on a regional basis rather than by separate village, town, city or county systems. Major recreational facilities for people from all parts of the metropolitan area should likewise be planned and managed on a regional basis. The development of navigable waterways serving the region — harbors, rivers, and port facilities — affects more than the central city alone. Where the two sides of the river or harbor are in separate counties, cities or states, a regional board is the logical agency to handle port problems. Airports are also a matter of concern to the surrounding cities and towns as well as to the central city.

IX.

THE PLANNING PROCESS

Universal Application of Planning Principles

As we have pointed out, planning for traffic and transit requirements, port development, water supply and other regional problems should be undertaken on a regional basis. Many other types of planning, such as neighborhood parks, playgrounds, school building requirements and automobile parking should properly be the function of individual municipalities. The fundamental steps of the planning process are the same, however, whether they are applied to a region, a county, a city, a town or a village.

These steps are:

1. Getting the facts
2. Analysis of the facts in relation to present needs and future trends
3. Making the master plan to solve the problems revealed by the facts and their analysis
4. Carrying out the plan.

Getting the Facts

The following questions are a few typical examples of the kinds of information that are needed for planning — all of which can be answered by *facts.*

1. How many people live in the region and in each of its cities and towns? How fast are these places growing? What kind of homes can the people afford?
2. What are the present and future opportunities for employment? Does the region have expanding opportunities, or is it barely holding its own?
3. Where do the people work? How do they get to work? How long does it take them?
4. What is the pattern of railroad and transit lines? Is the service adequate? Are new lines needed?
5. What is the origin and destination of the traffic on the highways? Where do the cars park and how long?
6. Where are the parks and playgrounds in relation to the homes? Are these parks and playgrounds large enough and close enough together for so many people?

Many of the facts and figures needed for planning already exist in reports of federal, state and local agencies and private organizations. Other data have to be obtained by new surveys, such as traffic counts and housing demand questionnaires.

In all planning studies, it is important to present figures in a way that will be easy for everyone to understand. Nobody can visualize 422,000,000,000 gallons of water being used in a year. But if we say that New York City needs about 148 gallons of water per person every day of the year for home, business and industrial use, it begins to mean something. And if we point out that 148 gallons would fill three ordinary bathtubs, everyone will get a clear idea of how much water we are talking about.

Philip D. Gendreau, N.Y

The Golden Gate Bridge . . . . This span of 4200 feet crosses the entrance to San Francisco harbor. The towers are 746 feet high.

Analysis of the Facts

When the basic facts necessary for a study of the problems have been assembled, the next step is to analyze what these facts mean in terms of future requirements. A comparison must be made between what we have and what we are going to need. First, the planner must make a careful estimate of future population growth. This will guide his thinking when he plans the size of areas that will be needed for living, working and playing; and will also help to determine the required capacity of transit lines, highways, and reservoirs.

Next, the planner must study the various ways in which future needs can be met. For example, if during the next 20 years, 50,000 more families are expected to need places to live, it would obviously be wrong to assume that they will *all* want to live in apartment houses; or *all* in single family houses, which many could not afford. It is also necessary to consider where people will prefer to have their homes. Careful estimating must be done, based upon past experience and present trends, in order to work out how much area the plan should provide for different types of new housing.

Another example of such technical analysis is furnished by the park problem. There are accepted standards for the number of acres of parks, athletic fields and playgrounds that are required for each 1,000 people in the age groups that use these facilities. If we know the number of people and where they live, and where the existing recreation spaces are, and how large they are, then we can determine what additional spaces are needed and where they should be located. In this way, the planner can provide not only for present day requirements but also for future increases in population.

Making the Master Plan

The controlling element in all planning should be a true appreciation of the people's needs. Every opportunity must be sought to find out what the people would like their future city and region to be. Suggestions and ideas should be obtained from citizen groups. Alternate sketch plans of proposed improvements can be printed in the newspapers to attract comment and criticism. Questionnaires are helpful in gauging public opinion. If the facts and the analysis of the facts are made known, it will help people to see the problems clearly and submit constructive proposals.

When the planning board and its technical staff have gathered and analyzed the facts, and appreciate the people's hopes and desires, they can proceed to draw up the master plan for solving present problems and coping with future needs. They can select areas of suitable size in the best avail-

Screen Traveler, from Philip D. Gendreau, N.Y.
San Francisco-Oakland Bridge . . . . Two suspension spans of 2310 feet each. San Francisco is in the background. The picture is taken from Yerba Buena Island in the harbor.

able locations for apartments and small houses, and then mark these areas on a map. They can determine what run-down neighborhoods should be rebuilt and how many families they should accommodate. They can suggest whether rebuilding is feasible for well-to-do families who can afford large apartments, or whether it would be better to devote particular areas to low income families.

Their study of present and future highway traffic will tell them how many new express highways should be built and where they should be located. They can then mark the approximate routes on their plan. In much the same way, they can select routes for new subways and bus lines.

They can choose a site for a new city hall, and prepare a plan for grouping other public buildings around it in order to develop a true civic center. By studying space and employee requirements of the governmental departments, they will know approximately how large these buildings should be.

All such matters are part of the master plan. While the plan is being made, it is the responsibility of the planning board to keep the public informed of its progress. Public understanding, approval and support of all phases of the plan is the key to its successful fulfillment.

The planning board is working for the future. It is therefore important that its plans and recommendations be based upon advanced principles of design. To do otherwise would be to repeat the mistakes of the past. The plan must not be out-of-date even before it is completed on paper! Fortunately, the engineering and architectural professions have made rapid strides in the past generation. It is therefore possible to design buildings and bridges, streets and highways in keeping with the City of Tomorrow.

Obviously, even long-range plans for rebuilding an existing town or city or region cannot be so far-reaching nor so advanced in design as would be possible in laying out a new city on vacant land. Concepts of what would be ideal must be modified to conform with existing streets and buildings that must be preserved. Huge investments cannot be sacrificed in the name of idealism. The soundest plan for the future is the one with the best balance between what would be most ideal and what will be most practical.

Carrying out the Plan

The final step in the planning process is getting the recommendations of the plan carried out. Some features call for immediate action; others must be postponed for many years. Translating the plan into the realities of brick and stone, steel and con-

crete, is always a long and gradual procedure. The measure of its success will be the strength of its popular support. If the plan is truly democratic, it will express the will of the people and their judgment as to what they need. They, acting through their elected and appointed government servants, will make the decisions that carry out the plan.

Wise decisions spring from clear understanding of issues. Problems of the present, such as the lack of an airport, are easier to understand than problems of the future when, let us say, three airports plus a dozen fields for private flying will be needed. The planning board has a great responsibility to inform the people of future as well as present needs in order to develop public understanding and pave the way for farseeing action.

The tools for carrying out the plan are described much more fully in Chapters X and XI, which are devoted to legal and financial procedures. Suffice it here to stress that democratic government functions only through laws and ordinances adopted by legislative bodies. If the plan recommends construction of a bridge, there must be a general or often a special law authorizing the proper government agency to build the bridge, and appropriating funds to pay for it.

The plan will also include many recommendations for improvements to be carried out by private interests. A good example would be a large project for rebuilding a slum area as a paying investment. In this case the officers or board of directors of a corporation, which might already exist or might be formed especially for the purpose, would vote to undertake the project and would make arrangements for its financing.

Thus, whether a feature of the plan involves public action or private action, there will usually have to be a decision reached by the *vote* of a group of people. Securing a favorable vote will always depend upon the interest and understanding and leadership not only of those who vote, but of very great numbers of other citizens who are convinced that the plan is sound, and are willing to work for its realization.

It is well to remind ourselves that our cities were built principally by private capital, not by government funds. The rebuilding of cities, in accordance with long-range plans supported by popular acceptance, will again be done principally by private capital. Banks are assuming increased responsibility for financing even such public improvements as bridges, tunnels and major highways, if these projects can pay their way through toll charges. For this purpose, special government agencies are created by law to construct and operate such facilities, with money loaned by the banks and secured by the toll revenues. The Triborough Bridge Authority in New York and the new Mystic River Bridge Authority in Boston are examples.

A master plan benefits all the people by furnishing the framework and pattern for a prosperous future. Carrying out the plan thus becomes a responsibility in which all should share, a community endeavor in which all should take a part.

"The right kind of planning will result if an informed group of active citizens in every community arouses public opinion and guides the planners in gradually making over each community into a better place for your family, your friends and you."[1]

[1] Planning With You, by the Editors of the Architectural Forum, 1943, page 15.

X.

LEGAL FRAMEWORK FOR PLANNING

Nature and Scope of Planning

Planning is a great responsibility. Who makes the plan and by what authority of law? What is the place of planning in government? And how is the plan carried out?

It is important to emphasize that planning is a thinking process to bring order into our physical environment. It recommends what should be done and when and how. The function of thinking and recommending is assigned by law to an official planning agency usually responsible to the chief executive. Because of its special nature, the planning agency is customarily kept separate from other branches of government. It is primarily an advisory and coordinating body.

Planning embraces two fields of work: consideration of *public* improvements to be provided by government, such as bridges, schools, health stations and playgrounds; and the regulation of the use of *private* land.

Planning private land use and development is accomplished by control of land subdivisions in the laying out of new streets; by the zoning ordinance, which regulates the use of property and the height and size of buildings; by building codes, governing the design and safety of structures; and by housing laws providing for special types of large-scale development, usually with some direct or indirect financial assistance by government.

These various kinds of laws — the legal framework for planning — will each be described, but first it is necessary to explain the way in which the planning agency itself comes into being.

State Planning Laws for Municipalities

City, town and village planning boards are authorized by a state enabling act, which customarily gives the mayor or other chief local executive the power to appoint the members of the board, subject to confirmation by the local lawmaking body. In Massachusetts, however, the members of town planning boards are elected.

The state planning enabling acts of most states are quite similar in content. They usually provide that municipalities may establish planning boards but do not require them to do so. Massachusetts is an exception in that all cities and towns over 10,000 population *must* set up planning boards.

Members of planning boards almost invariably serve without pay. They are usually leaders of the community drawn from business and the professions. A typical planning board might include most of the following: a bank president, the head of a large retail store, a lawyer, an engineer, an architect and a member of the clergy. The board sets policy and oversees the work of preparing plans. These plans may be drawn up by the board's own staff or by outside consultants.

As the members of planning boards are prominent citizens, giving their time to work that is vital to their communities,

their plans and advice should be carefully heeded not only by those in official positions but also by the general public. The present trend in a great many states is to give planning boards increased authority over matters pertaining to public improvements.

County and Regional Planning Boards

In some states, of which California is a notable example, the state has authorized county planning boards for the purpose of making plans for larger and more self-contained geographic areas than individual cities and towns. In several states, there have also been created, usually by special legislative act, official regional planning boards with jurisdiction over a group of counties embracing a parent city and its environs.

State Planning Boards and Development Commissions

The state legislature may also create a state planning board to deal with problems of such wide scope that they cannot be handled by local, county or regional boards. The state boards are usually appointed by the governor and serve in an advisory capacity to him. In a good many states, these agencies now take the form of "development commissions" and are also concerned with promotion of the commercial and industrial future of the state.

National Planning

In the federal government there is at present no over-all planning agency as such, though planning in specific fields is of course carried on continuously by separate bureaus and departments. An Act of Congress would be required to establish a permanent federal planning board with authority to prepare plans on the national level and coordinate the planning activities of federal agencies.

Master Plan and Official Map

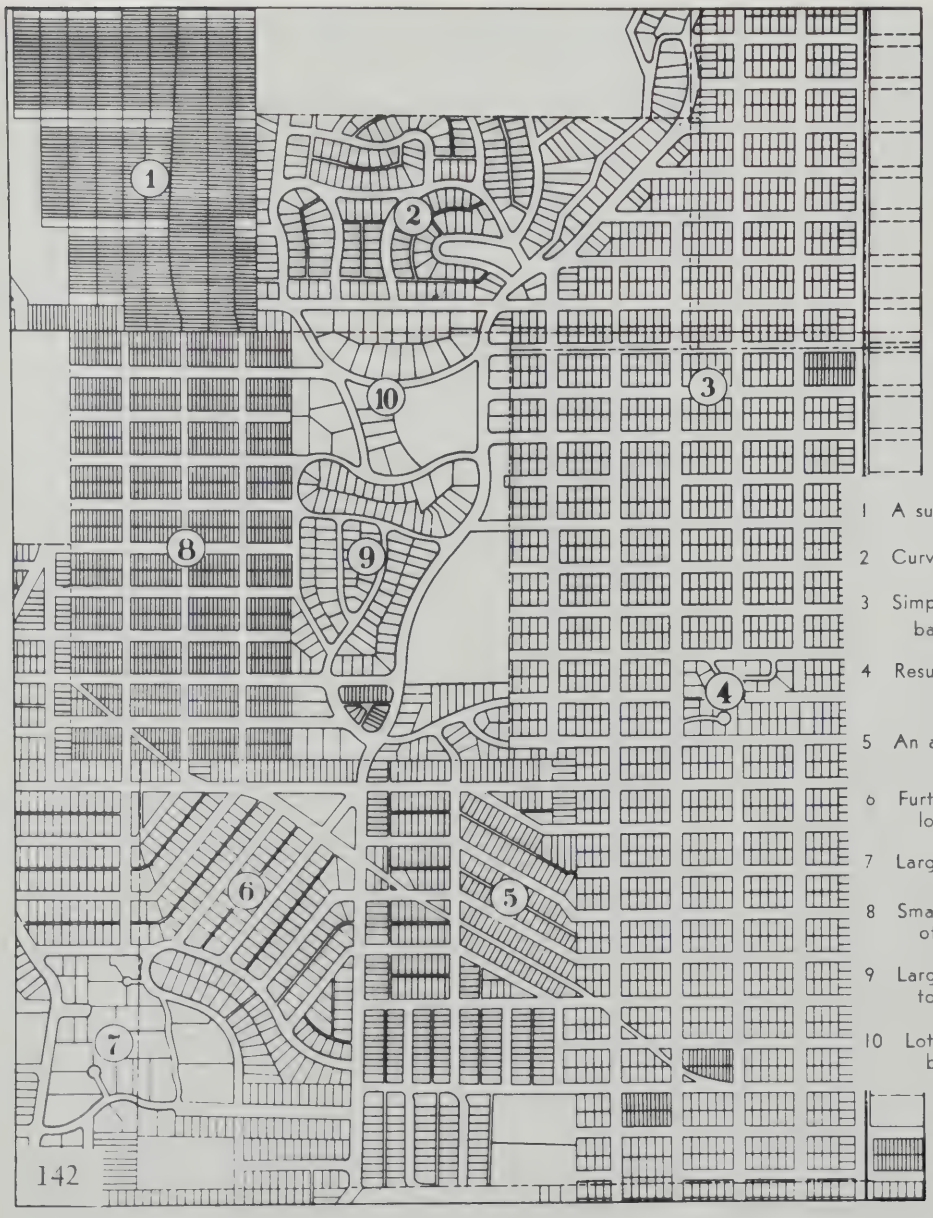
The planning board has the responsibility of preparing the master plan, showing existing and proposed streets and highways, bridges and tunnels, transportation lines, recreation areas, waterways and pierhead lines, sites for public buildings, routes of public utilities and zoning district boundaries. These are all features over which there is public control. The plan is adopted by the planning board, usually after public hearings, but it remains an advisory plan, serving as a guide to the legislative body and other local government departments.

Many states also provide for adoption of an "official map" by the municipal legislative body. Unlike the advisory master plan, this official map definitely fixes the lines of streets and parks. No person may put up any building within the boundary lines of any street shown on the official map — even if the street has not been cut through and built. The official map should be based on the master plan. Good practice is to transfer proposed new streets from the master plan to the official map well in advance of their construction. Master plan recommendations can thus be officially adopted piece by piece as the time approaches for actually carrying them out. Changes in the official map are usually required to conform to the master plan; but if the legislative body is in disagreement with the planning board, it can vote to over-ride the board's master plan.

In Massachusetts, the town of Weston was the first to adopt an official map (1946).

Subdivision Control

As most vacant land is under private ownership, its subdivision into streets and building lots is usually initiated by private land developers rather than by government. It is the responsibility of government, customarily through the local planning board, to advise the owners and guide their efforts so that subdivisions will be well planned and good street construction assured. Until the subdivision layout has been formally approved and officially placed on file, building lots cannot legally be sold nor houses constructed. In this way the prospective home owner is protected against investing in property that does not measure up to community standards.



San Diego — Unrelated Subdivisions . . . This hodge-podge of piecemeal subdivisions resulted from insufficient control by official agencies.

Many different types of subdivisions are represented in the exhibit

1 A subdivision without streets; 25 foot lots.

2 Curvilinear streets — an attempt to fit the terrain.

3 Simple rectangular scheme — excess area in streets — bad grades

4 Resubdivisions to secure better street grades and salable lots.

5 An angular pattern based upon an old narrow road.

6 Further attempts to meet topographic conditions — note long blocks.

7 Large lots — streets minimized.

8 Small lots, streets wide in one direction, narrow in another — varied street widths.

9 Large lots, long blocks, varied street widths; an attempt to develop all assets of property.

10 Lots and development suited to area, but hemmed in by inappropriate schemes of development.

It is the duty of the planning board to see that the subdivision conforms with the master plan and official map and therefore does not conflict with other projects, such as proposed main highways or sites for future schools and parks. It is particularly important that the new streets form a convenient pattern with adjacent streets. The planning board will also see that the subdivision layout conforms with the topography, so as to avoid unnecessarily steep streets and undesirable building lots.

Even on level ground, it is desirable to avoid excessive repetition of long straight streets and rectangular blocks. This type of layout, the so-called gridiron pattern, used to be accepted practice before better street designs were devised. It is lacking in imagination and does not lend itself to good neighborhood planning and development. As we have mentioned before, the gridiron encourages through traffic in residential communities and creates a hazard for young children.

An unusual patchwork of adjacent subdivisions is illustrated here. Their good and bad features are described in the caption and are well worth studying.

Subdivision control is the best way to secure well designed neighborhoods, complete with planned locations for stores, off-street parking for automobiles, school and church sites, and small parks and playgrounds.

To simplify the work of the property owner and his surveyor, the better planning boards publish brief regulations, explaining what standards of design and layout are to be expected. Many planning boards require that the developer pay for or guarantee the cost of paving the streets and installing sewers and water mains. This policy discourages the premature subdivision of land before it is needed for home sites.

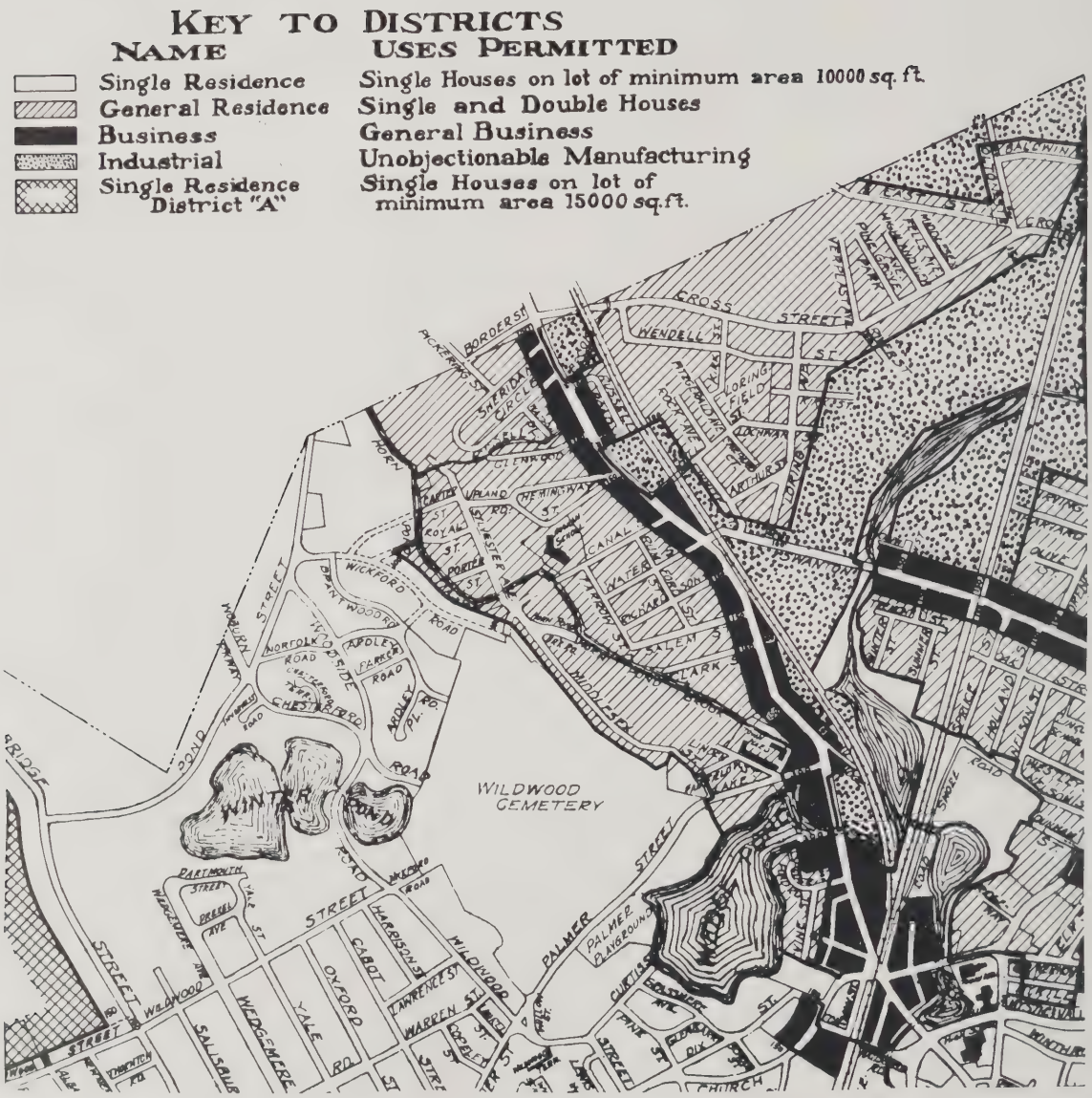
Zoning

State Zoning Laws: Zoning is one of the most important methods of regulating the use of land and buildings. It has been defined as "the regulation by districts of the height, area and use of buildings, the use of land and the density of population."[1] A state zoning law authorizes local legislative bodies to pass zoning ordinances. The law generally requires that the local zoning ordinance and maps be prepared by the planning board or by a specially appointed local zoning commission. They are then officially enacted by the local legislative body or town meeting after public hearings have been held.

Zoning Ordinances and Maps: The zoning map, which is part of the ordinance, divides the municipality into a number of different *types* of districts such as one-family, two-family, apartment, local business, central business, light industry and heavy industry. There may be many geographically separate districts of each of these types. And there might be subclassifications of each type: for example, a single family district requiring one acre of land for each house; another requiring only a quarter acre; and another a mere 4000 square feet. Within each type of district, wherever located, exactly the same regulations apply. A section of a typical zoning map is illustrated here.

Local Zoning Administration: After adoption of the zoning law by the local legislative body, its administration and enforcement become a function of the building commissioner. He is a public official charged with the responsibility of enforcing laws

[1] The Master Plan, by Edward M. Bassett, page 29.



Section of Zoning Map, Winchester, Mass. . . . Note the different types of zoning districts described in the key.

concerning the location, construction and safety of buildings. He examines building plans to make sure they conform to the requirements of the zoning law and building code. He sees to it that a building is erected in accordance with the officially approved plans. When buildings are completed, he makes periodic inspections to determine whether they are in safe condition. The building commissioner's decisions are based strictly upon existing laws. In zoning matters, appeals from these decisions may be taken to a zoning board of appeals. This frequently happens in special situations where strict application of the zoning law would inflict severe personal hardship on individual property owners.

For example, a man may own a lot in a single family district and that type of district may require a 25-foot yard in front of every new house. If his is the only vacant lot in the block, and if all the other houses have front yards only 15 feet deep — having been built before the ordinance was adopted — it would be unreasonable and unjust to oblige this owner to provide a front yard 25 feet deep for his house. The zoning board of appeals could grant this owner a "variance," giving him the right to built his house with only a 15-foot front yard.

Zoning as a Protecting and Guiding Force: Zoning is a system for protecting established neighborhoods from the intrusion of new buildings that would injure property already developed, and for guiding the type of development in new neighborhoods. In the United States, Boston made the first attempt to apply zoning principles. In 1892 a law was enacted restricting the height of buildings. This law, as amended in 1904, was upheld by the United States Supreme Court and is the cornerstone upon which rests the legal principle of zoning for height. In 1916, New York City adopted the first comprehensive zoning ordinance, with complete use, height and area provisions.

Zoning stabilizes property values. It prevents a store or factory from locating next door to a private home. Zoning guides future stores and factories into the right places; and in a new neighborhood it can provide a small district for a local shopping center. Zoning also establishes minimum lot sizes for new neighborhoods, so that there will not be little houses on 25-foot lots mixed in with large houses on 100-foot lots. In many such ways, zoning brings order and arrangement into the pattern of building development. It is, of course, much easier to assure orderliness in new areas than to straighten out the hodgepodge of old areas. This too can be accomplished, though slowly, by requiring that old buildings be torn down or made to conform with new zoning requirements within a specified number of years.

In central business districts, the most critical problem today is parking. Here too, zoning laws can be of special value. Street space is too essential for moving traffic to permit automobiles and trucks to line the curbs and use the public street as a private garage or freight station. The zoning regulations can permit off-street parking lots, and can *require* large new stores, office buildings and theaters to provide garages or open parking for the use of patrons. The regulations can also *require* that such buildings shall have off-street loading bays for trucks, as do modern central post offices.

Another application of modern zoning is to prevent the construction of high buildings or radio towers near an airport. The sur-

roundings of airports should be zoned with strict height limitations on all future buildings. In this way, not only is public safety benefited, but the value and utility of the airport are permanently protected.

Building Codes

The building code is a local law establishing minimum standards for materials and methods of construction, so as to assure the structural safety of buildings, their durability, and their reasonable resistance to fire. The code is not the direct province of the planning board. It is mentioned here because it is one of the legal tools for assuring high community standards in carrying out the master plan.

Many municipalities do not have local building codes, and safety of construction is regulated only by general, and often inadequate, provisions of state law. Many other municipalities have codes that are out-of-date and make no provision for permitting new types of building materials (glass brick, pre-cast concrete, plastics, fire-resistant wall board) nor for new methods of construction (factory fabrication, pre-assembled plumbing units). Both the lack of codes and the existence of obsolete codes are matters of serious concern to planning boards.

A good building code should be as simple as possible, and should be flexible enough to permit the use of future inventions and cost-saving techniques that are equivalent to those previously in use and approved. Rigid hard and fast codes, on the other hand, perpetuate old-fashioned and obsolete designs, methods, and materials and increase the cost of construction.

Building codes differ from city to city and town to town, even in the same region or state. Effort is now being made to prepare satisfactory standard codes for widespread adoption. The Bureau of Standards in Washington is taking an active part in this endeavor. Much can be accomplished by state legislatures, with their power to pass laws for cities and towns in furtherance of public safety.

Housing Laws

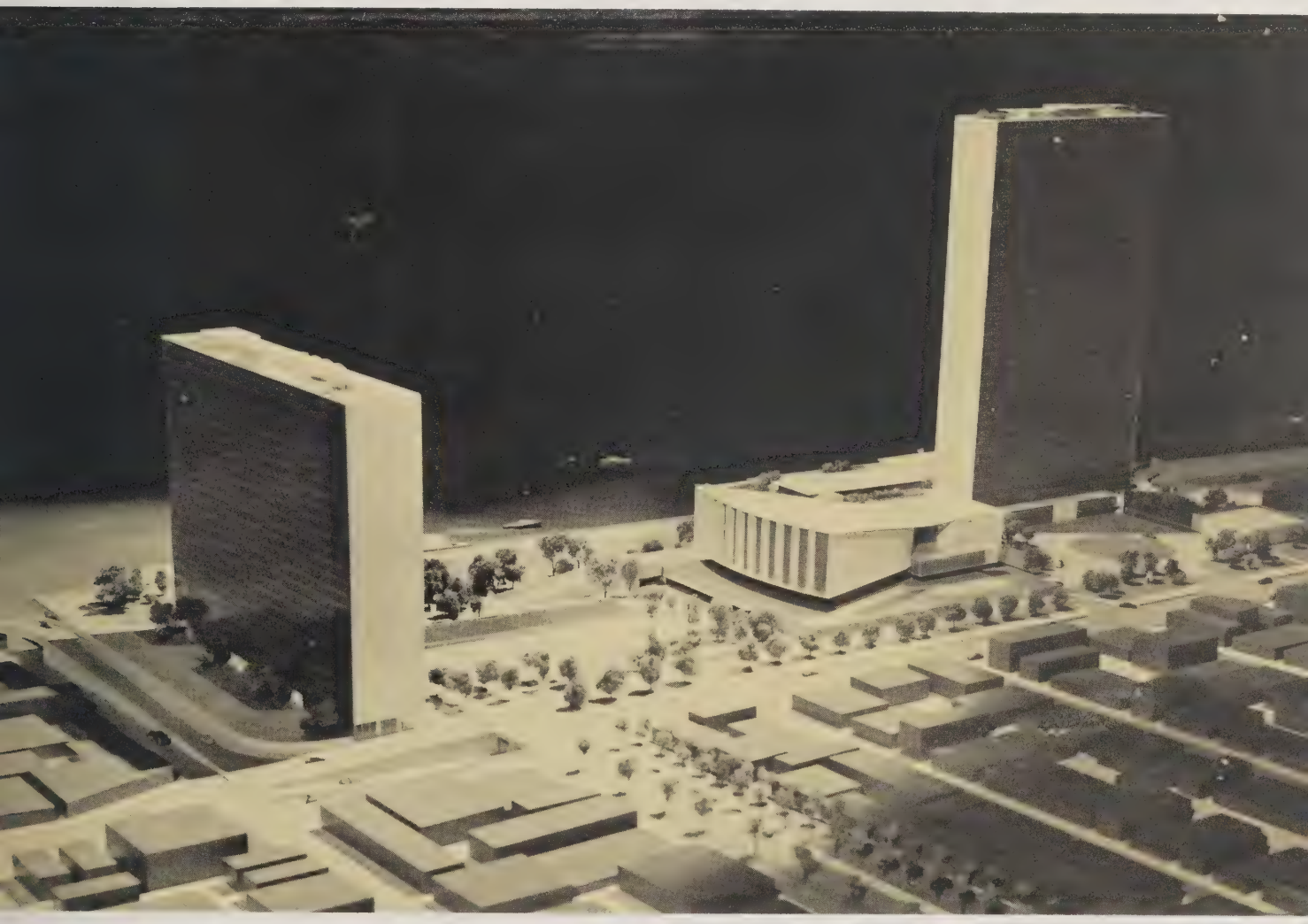
Beginning in New York State in 1926, there have been a great many state laws adopted to encourage large-scale private residential building construction. These laws give the developer certain advantages, such as partial tax exemption, in return for limitations on rents or profits. In 1947, there were 25 states with so-called "urban redevelopment laws."

There is increasing recognition that the major obstacle in rebuilding old and decrepit residential neighborhoods is the high cost of acquiring the land. Many developers and planners are convinced that part of this cost should be borne by government, in recognition that clearance of blighted areas is in the public interest. Progress in this new field will not be substantial until the current housing shortage has been relieved by new construction on vacant land.

In addition to large private building operations, the years immediately preceding World War II saw the construction of many public housing projects designed to replace slums, and provide good rental homes for low income families who could not otherwise afford them. This program was established by federal legislation and includes fed-

eral annual subsidies to municipal housing authorities to pay a part of the cost of maintaining very low rents for these homes. The public housing projects are exempt from real estate taxes. Instead, they pay a "service charge," which is substantially less than these taxes.

Housing projects of large size, whether constructed under private or public auspices, are an important factor in the life of the community and bear a direct relation to the master plan. Often, many little streets can be closed, and "super-blocks" created. By replacing old blighted blocks of buildings, these housing projects carry out the planning board's objective of making a better city.



Official United Nations Photo

Model of Design for United Nations Headquarters . . . . Tall building at right is the Secretariat — a 39-story structure with office space for a staff of 4,200 people. To its left is the General Assembly, where the delegates and advisers of at least 70 member nations will hold their meetings. There will be room for over 1,300 spectators. The large building at the left may be constructed at a later date. It is tentatively planned as offices for the national delegations and the international specialized agencies associated with U.N. The site embraces six blocks along the East River in New York City, from 42d Street to 48th Street.

XI.

FINANCING THE PLAN

Financial Difficulties of Cities

In the past, American cities have spent millions of dollars for public improvements without first preparing comprehensive plans and long-range step by step programs for financing such projects. The result of this lack of foresight has often been extremely costly.

It is now recognized that city governments must look ahead and anticipate future needs before conditions become critical. Too often, failure to look ahead has meant that only piecemeal remedies could be carried out — remedies that were "too little, too late." For instance, many cities waited until traffic congestion was intolerable before undertaking street widenings and extensions. By waiting so long, the cost of acquiring the needed additional land became well-nigh prohibitive. Similarly, school sites of one acre or less were acquired, where five to ten acres were needed. By the time the mistake was realized the schools were hemmed in by buildings and their sites could not be enlarged. In early days, many cities owned a great deal of land and proceeded to dispose of it for little or nothing, only to find themselves later compelled to buy back at high prices the minimum essential parcels for schools and parks and other public uses.

Sometimes cities did try to look ahead but when they did, they frequently failed to exercise sound judgment. They borrowed and expended large sums to construct streets and utilities in subdivisions that have never been built-up with houses. They also neglected to provide modern facilities in old established neighborhoods and thus failed to maintain their attractiveness. Instead of achieving stability, through planning, these practices encouraged decay, exodus of population, and loss of taxable property values. The people of most cities look back and say: "If only we had known." Now they must look forward and declare: "We will do much better from now on!"

It would not be fair to place the blame on previous generations of public officials. The blame properly rests with the citizens as a whole, because it was they who failed to insist that their government representatives make ample and wise provision for the emerging needs of the future. It was a failure due to ignorance, lack of interest in civic affairs, and lack of vision.

Most cities must prepare to face a period of intense rivalry for commerce and industry and population, for it is inevitable that some cities will continue to grow at the expense of others. The future holds an opportunity and a challenge either to gain strength through intelligent and forceful community action, or to lose population and wealth to the cities that *are* planning ahead and providing a more attractive and efficient environment for business and industry.

All cities must reshape and rebuild their central blighted areas as a matter of self-preservation. If they delay, the drain of population to surrounding suburban areas

will surely continue at a faster rate.

Before the advent of rapid transit and the automobile, the tendency was toward congestion of population in the heart of cities. Natural increases in population were supplemented by a great influx of people from rural areas, and by the arrival of millions of immigrants. Since these people were employed by industries in central locations they sought homes near their places of work.

The city provided streets, parks, schools, fire protection, water and other municipal services for this increase in population. The cost of government rose rapidly. This process of concentration continued through the first two decades of the 20th Century and as the city's population increased, its income from taxation also mounted. However as life in the slums and congested districts became less and less desirable, those who could withdrew their financial support from the city by moving farther out along the lines of public or private transportation. The mass production of automobiles further accelerated this exodus.

The provision of streets, schools, parks and mass transportation in the outlying areas duplicated services and facilities that already

New York City Park Dept.

Hudson River and George Washington Bridge . . . . This bridge was financed as a toll project by the Port of New York Authority.

The District of Columbia — Metropolis of Government. *U.S. Army A.A.F.*

existed in the older sections around the center of the city. This duplication has produced a serious strain on municipal finances. Maintenance costs in the center have continued while tax receipts have decreased. At the same time the cost of servicing the new outlying developments has absorbed all of the taxpaying ability of those who moved into the new districts. As a result, cities are today facing the dilemma of trying to provide more extensive municipal services with steadily decreasing municipal income.

In fact, in many centrally located blighted areas, the city spends more money than is returned in taxes. A detailed study of one run-down area in Cleveland[1] showed a tax return of $225,000 and a cost to the city of $1,950,000 for a selected list of major municipal services, such as education, police and fire protection. In other words, the city was directly subsidizing this slum to the extent of $1,725,000 every year. An exhaustive survey of income and cost covering all parts of the City of Boston showed that for 15 blighted areas the municipal expenditures exceeded combined tax income by a total of more than $3,000,000 annually.[2]

Necessity for Long-Range Financing

The techniques of city and regional planning are now well established. The greatest obstacle in the rebuilding of America's cities is the financial cost and the problem of distributing that cost wisely over the years ahead. Not planning but the *carrying out* of plans is the real challenge. The paramount question is: How can any city carry out vast plans involving the expenditure of millions of dollars when it is already overburdened by present operating costs? Most cities know *what* they must do if they are to continue to prosper, but few have as yet found out *how* they can do it. The answer is a combined program of long-range master plans and long-range financial programs. The two

[1] An Analysis of a Slum Area in Cleveland, Regional Association of Cleveland 1939, page 6.

[2] Report on the Income and Cost Survey of the City of Boston, by the Boston City Planning Board, 1935.

should go hand in hand. While considerable progress has been made in the preparation of master plans, few major cities have set up official financial programs.

Capital Programming

The long-range financial program, or "capital budget and program" as it is sometimes called, lists projects from the physical plan of public improvements by categories (schools, parks, streets, etc.) in their order of urgency. It shows their estimated cost; the method of raising the money to pay for them; the time necessary for completion; and the annual expenditures involved for interest, repayment of capital, and maintenance. These annual expenditures must then be included in succeeding tax levies.

In the city of New York, the charter requires the City Planning Commission to prepare a detailed capital budget each year, and also a more generalized capital program for the succeeding five years. These documents are officially adopted by the City Council and Board of Estimate. Among other large cities that have taken steps in this direction are Baltimore, San Diego, Dallas, Philadelphia, Cincinnati and Cleveland. In the Boston region, a considerable number of towns and small cities have shown the foresight to adopt a similar policy. Examples are Arlington, Brookline, Dedham, Needham, Quincy, Reading, and Winchester. Their capital budgets and programs, however, are merely advisory, rather than officially binding upon the local legislative body as in New York.

In setting up a capital budget, it is wisest to base it upon known local, state and federal resources, and established cost-sharing programs. Actual expenditures for construction can then be speeded up or slowed down to fit future increases or decreases in state and federal financial aid.

Methods of Financing Capital Improvements

Large projects are usually financed by borrowing money. Municipal bonds are sold to get this money.[1] Payment of interest and repayment of the principal of these bonds may be met in three different ways, depending on the type of improvements: (a) from general tax revenues; (b) from special revenues (water taxes, bridge tolls, automobile parking fees etc.); (c) from special assessments levied against the real estate in the area particularly benefited by the projects — local sewers, paving of minor roads, street widenings, small playgrounds etc.

Sometimes the cost of projects is paid all at once by a lump sum appropriation in the next annual tax budget, thus saving interest charges over a period of years. This method, known as "pay-as-you-go," is coming into increasing favor in cities that are in good financial condition. For example, a large city may need to replace one school every year for 40 years to come. And at the end of 40 years, it will have to start its replacement program over again, because schools do not last forever. If each school costs $1,000,000, a city operating on the pay-as-you-go plan puts $1,000,000 in its tax budget every year. However, if the city finances its schools by 40-year serial bond issues with two per cent interest charges, each school will cost $1,462,000. At an interest rate of four per cent, the cost would be $2,000,000. In other words, the city would pay twice over for every school it

[1] Federal and state grants of funds are made to municipalities for certain types of public improvements. These grants cover all or part of the cost.

Maine Turnpike Authorit

The Maine Turnpike . . . . A modern express highway financed by tolls.

built, or more than $80,000,000 for 40 schools costing only $40,000,000 to build.

On the other hand, a small city may need just one new high school, costing $3,000,000, with indications in the city plan that no other new high school will be needed for 40 years. In this case, it is entirely justifiable to spread the cost of this one school over a long term of years, accepting the interest charges as a necessary means of financing an expensive project that cannot be saddled upon the taxpayers in a single year.

Three Steps for Public Works Programs in Cities

The foregoing discussion leads to the conclusion that a city should undertake three distinct but related steps, which together constitute a long-range policy for public works construction. Their aim is to assure the gradual rebuilding and extension of public facilities, so that the city will keep pace with the times, and be well able to compete with other cities of its size and importance.

The three steps may be summarized as follows:

1. Preparation of a comprehensive plan for all public improvements necessary over a long period, such as 20 to 30 years. This phase of the work is described in earlier chapters.

2. Detailed analysis of "financial capacity," giving the present and future financial obligations and resources of the city govern-

ment and interlocking government agencies (school boards, park districts, etc.). This analysis should cover a long term of years, so that the effect of proposed bond issues on future tax rates will be clearly shown. Both annual tax resources and borrowing capacity must be estimated for each year. The analysis should also include tabulation of prospective annual revenues and operating expenses, and a study of capital grants available from state and federal sources.

3. Preparation of a one year capital budget and a five or six year capital program. This step lists specific projects from the comprehensive plan, arranges them in order of urgency, and restricts their number and total cost to the financial capacity revealed by Step 2. It is the official statement of policy covering all public construction to be undertaken.

Step 1 should be revised from time to time, in the light of new developments and unforeseen conditions. Steps 2 and 3 should be repeated annually. It is well to note here that capital programs, though a recent administrative development in governmental procedure, have long been standard practice in large private industries.

Capital Programs for Metropolitan Regions

As yet, long-range comprehensive financial programming for entire urban regions, as distinct from cities, has made little progress. Regions are composed of many independent local governments and overlapping metropolitan agencies, each with different

The Maine Turnpike . . . . A modern express highway financed by tolls. *Maine Turnpike Authority*

areas of jurisdiction, obligations, resources and financial policies. There are great basic difficulties in consolidating the estimates of revenues and expenditures; and generally there is no one agency with authority to undertake the task.

Financial programming can be done, however, for specific types of improvements entrusted by law to particular governmental units, each operating in its own field. For instance, a port authority can budget its future capital outlays for docks, warehouses and terminals; a metropolitan park district can budget its contemplated park and parkway construction; and a water district can plan far ahead for reservoirs, dams, aqueducts and distribution systems. There is a growing tendency toward consolidation of separate agencies such as these, thus increasing the opportunity to see what the whole picture of the future will look like, what it will cost, and how it can be financed.

Capital programs can best be made on a regional basis for those public improvements that are regional in scope and character; and on a local basis for local improvements that are of concern only to the individual town or city.

New York City Park Dept.

Rockaway Beach, New York . . . . An example of a notable public improvement.

Private Rebuilding Operations

This chapter has been devoted to a discussion of *public works,* financed by governmental funds. They furnish the skeleton framework of public streets and transit, schools and parks, water lines and sewers. Into this framework fit the residential, business and industrial buildings financed by private enterprise. Actually, private construction represents by far the major proportion of the city's physical make-up. It cannot be budgeted on an over-all basis for a period of years in advance, as it involves the efforts of many thousands of private corporations and individuals, working independently of each other. They do not, however, work independently of the city and its government. It is the responsibility of government to guide but not to direct private operations; to indicate on its plan those areas most suitable for different types of rebuilding and new development; to encourage large-scale construction; and to provide many public facilities and services. There are thus many opportunities for joint public and private cooperation in city rebuilding.

Conclusion

Nearly everything that man builds becomes obsolete or wears out, and has to be replaced. At the end of another 100 years it is probable that most of the buildings and public works in our cities of today will no longer exist. Perhaps only a few fine churches and other monumental structures will remain. With private capital and public tax funds, the job of rebuilding must go forward. The process is often very gradual, but each new building, each new bridge, each highway and transit line will take its place as part of the future city. Surely it is elemental wisdom to plan all these things in advance with relation to each other, so that they will make the maximum combined contribution to the general welfare.

A special reason for planning public works in advance is that great sums of money are involved. This is the taxpayers' money — your money. Inevitably, this money is going to be spent. What you want to know is: how wisely will it be spent? Inefficiency and wastefulness must be kept to a minimum. Just as large private corporations take into account the gradual deterioration of their physical plant, and make financial provision for its replacement after a period of years, so also must our cities make financial provision for rebuilding and extending *their* physical plant.

The combined physical and financial planning of public works offers great promise for the orderly development and rebuilding of our cities and urban regions. This procedure has already been employed long enough and by enough cities to prove its incalculable value. Only through such planning can needed public improvements be financed with due regard for future tax revenues and for the relation of projects to one other.

The Heart of Boston

U.S. Navy

Part II.
Greater Boston Acts for Tomorrow

I.

THE HERITAGE OF PAST GROWTH

Before presenting solutions for the problems that Greater Boston faces today, we must first understand how the region grew and the factors that influenced that growth. By comparing the present metropolis with the Boston of yesterday, we can see how certain problems have arisen and how the failure to solve them in the past complicates their solution today.

The Metropolis as a Physical Unit

Since Boston's settlement in 1630, its history has been interwoven with that of the Greater Boston region. Today it is virtually impossible to separate Boston from its surrounding area when one considers commercial and industrial activities, the port, transportation, and even the local street pattern as it merges into those of adjoining cities and towns.

Despite this basic unity, the relations between Boston and its suburban municipalities have frequently been lacking in harmony and singleness of purpose. Two conflicting tendencies — one toward complete identity of the city and region, and the other toward sharp political cleavage — have repeatedly influenced the life and physical framework of the metropolitan area. Boston is recognized as the commercial and cultural hub of the region but the suburban cities and towns have jealously guarded their status as independent communities.

Antique Views of Boston

Bonner's Map of Boston, 1722 . . . . Note surrounding water areas that have since been filled in.

We find these small self-contained and self-reliant towns springing up on the outskirts of Boston during the earliest years of the Massachusetts Bay Colony. They were settled originally because of the necessity of earning a livelihood by farming. Formation of this cluster of independent communities explains why Boston bears a different relation to its surrounding cities and towns than that of most other American cities, where suburban communities developed only when the central city overflowed its boundaries.

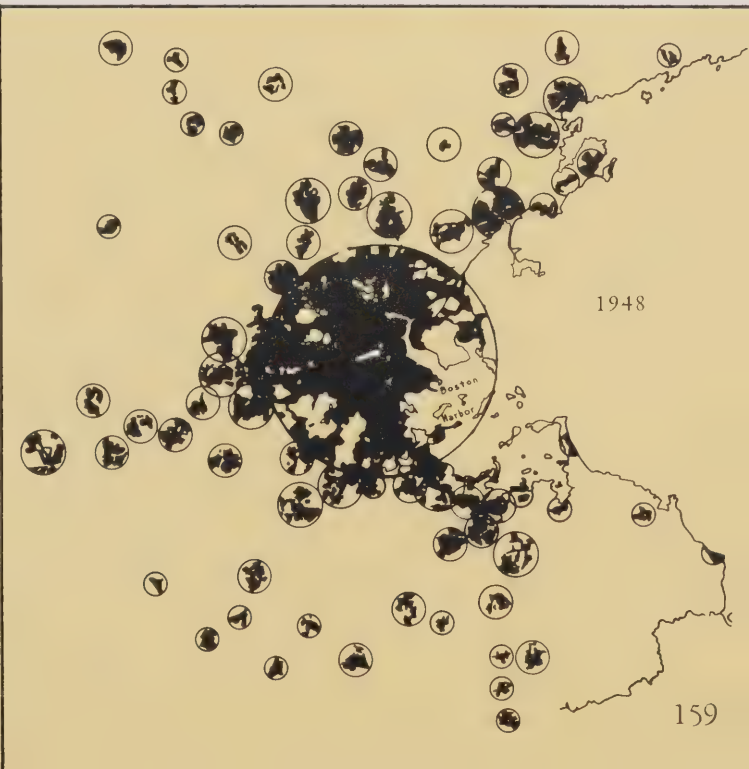
Lacking any over-all authority to direct or even advise them, each of the early cities and towns around Boston built only those facilities that were necessary for its own immediate needs. No attention was paid to the requirements of the region. For instance, many hundreds of miles of local highways were constructed, with each municipality's street pattern usually bearing no relation to those of adjacent communities. Local water supply, sewerage and park systems were built in the same disjointed manner. These were adequate only as long as each community remained isolated and self-sufficient.

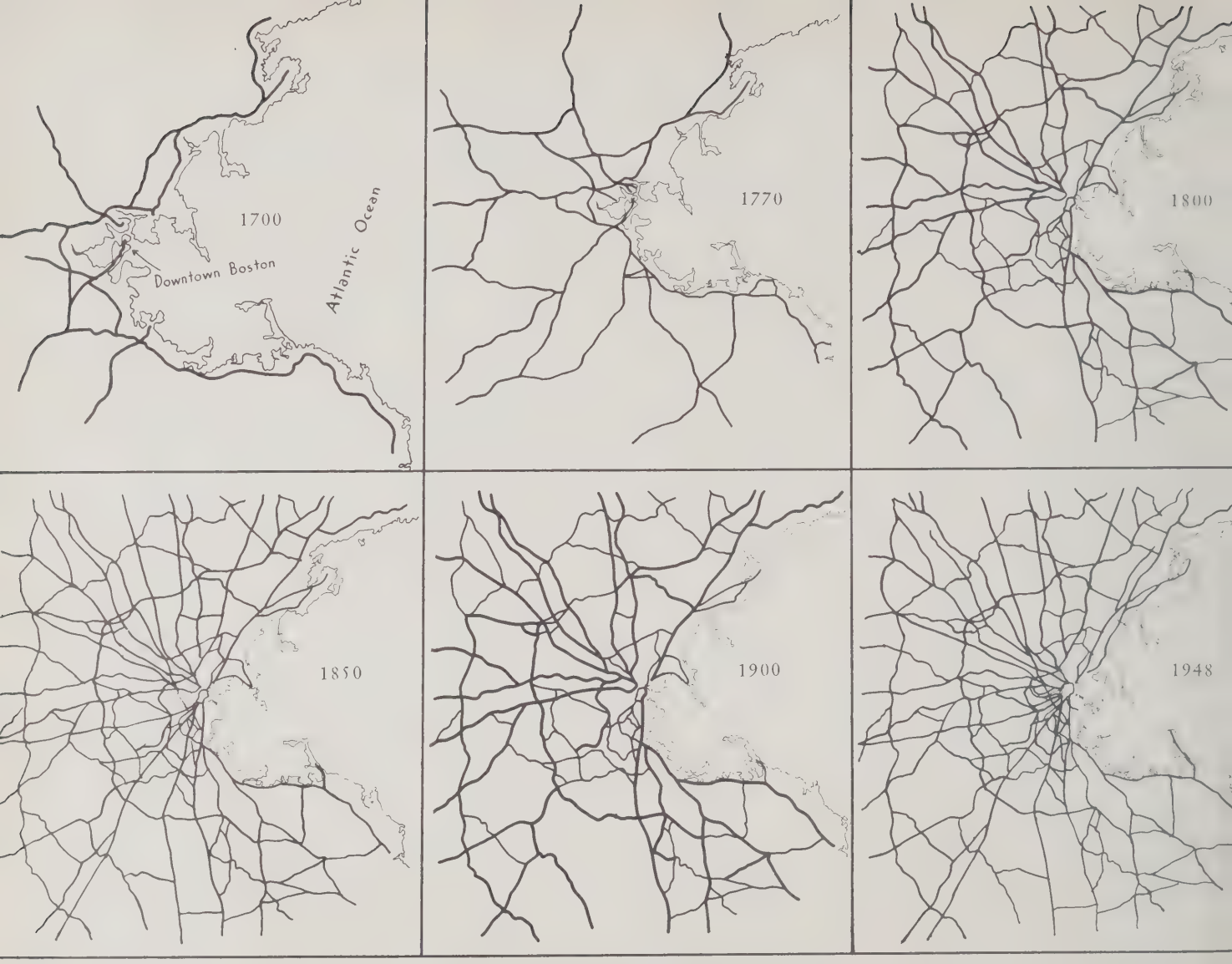
We can see great contrast between the two adjacent maps. In 1850, the suburban towns were still separated from each other by open country. The 1948 map shows that the entire inner core of the region is now almost solidly built up.

As rapid growth absorbed the vacant spaces between the towns within five miles from downtown Boston, the region for the first time became aware of the growing problem of urban congestion. It was realized too late that careful planning guidance could have prevented the almost complete disappearance of open areas between Boston and its nearer suburbs. To relieve this increasing congestion, Boston and the Commonwealth developed an extensive park system for the region during the final 25 years of the 19th Century.[1] The building up of vacant land, however, has continued

[1] See pages 244 and 245.

The Boston Region — Pattern of Communities





Development of Regional Highway Network

to the present time while few major parks have been created in recent years.

The accompanying groups of maps show changes in the physical framework of Greater Boston during various stages from colonial settlement to metropolis. These maps portray the extent and pattern of highways, railroads, rapid transit lines, land reclamation, and the water supply system.

Evolution of the Highway Pattern

Boston, as the center of commerce, naturally became the focal point of the region's highway system. As can be seen on the first in the series of highway maps, there was a simple system of roadways converging on the Boston peninsula as early as 1700. By the time of the Revolutionary War, this highway system had developed into a clear pattern of radials leading into Boston. The map for the year 1800 shows many additional radials connected by circumferential highways.

The radial highways followed the river valleys and the easiest routes over the hills to the port of Boston. Today as many as 35

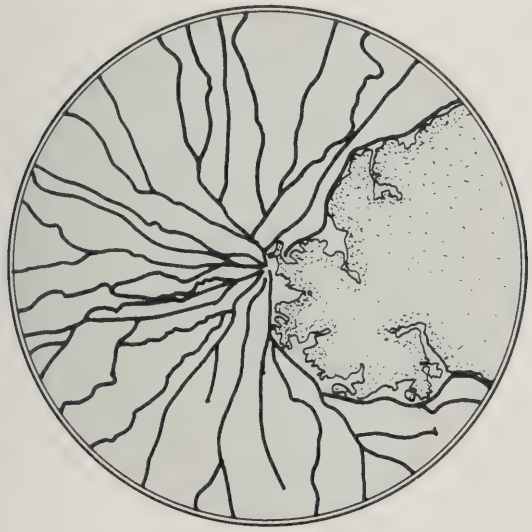
of these radials can be counted at a distance of eight miles from the State House. Spaced with remarkable regularity, they constitute the principal feature of the region's highway framework. The radials are met at right angles by circumferential roads at points where they pass through towns and villages. But the regular circle of these circumferentials is frequently broken because they fail to continue across the radials. These patterns are brought out clearly on the sketch plan of radials and circumferentials.

Development of Railroads

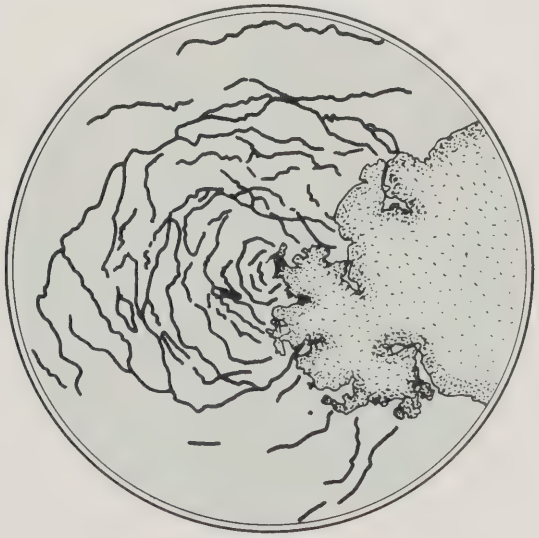
Until 1830 the modes of transportation in the Boston region were essentially the same as they had been for 200 years — ships by sea and horse-drawn wagons by land. Then, within the brief space of two decades, the railroad entered the Boston scene and transformed the city from a comparatively small trading center into a great metropolis.

The first company to build and operate a railroad line in the United States was organized in Greater Boston. This was the Granite Railway Company, incorporated under a charter granted by the State Legislature in 1826. This railway hauled huge blocks of granite from a quarry in Quincy to the Neponset River. They were then transported by water to Charlestown, to build Bunker Hill monument.

Radial and Circumferential Highways . . . . Note that the radials form a nearly complete system, while the circumferentials are very disconnected.



Radial



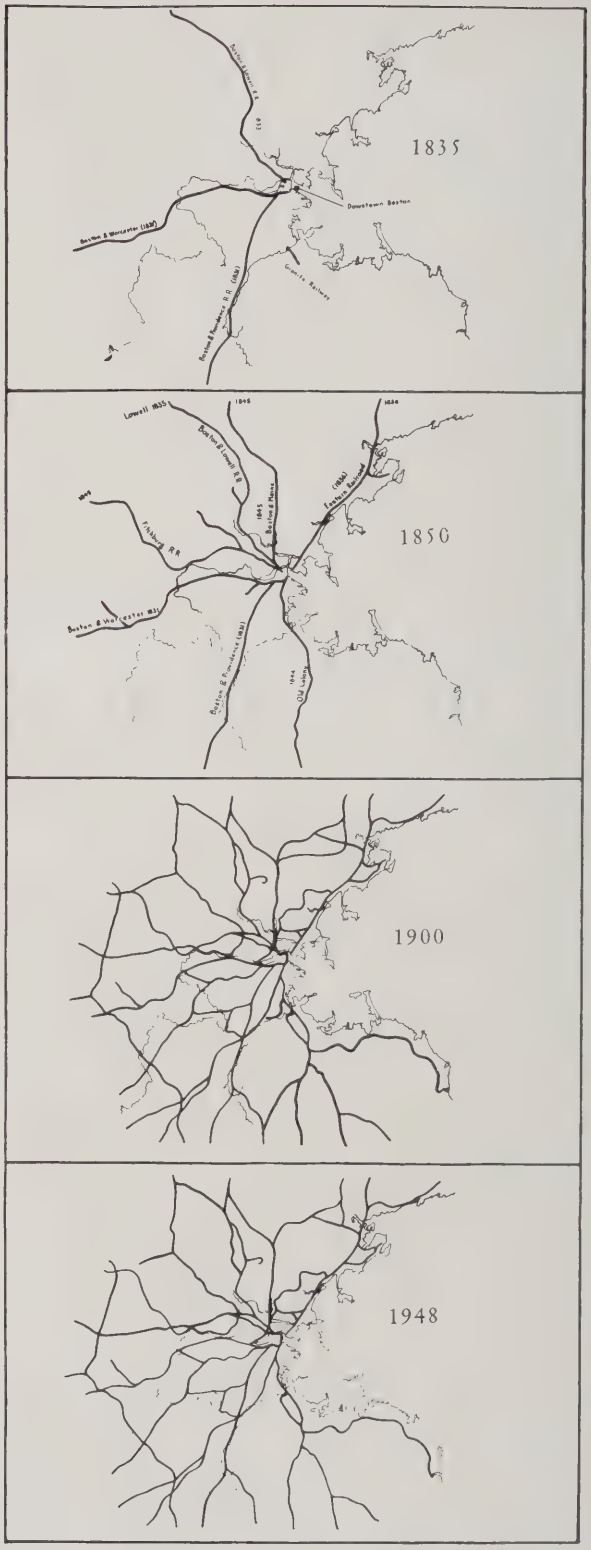
Circumferential

By 1835 Boston had three passenger railroads in operation. They connected Boston with Worcester, Providence and Lowell. Four additional railways were built by 1850 (see maps). Two of these still retain their original names, the Old Colony, and the Boston and Maine. Many additional branch routes were constructed during the following 30 years.

Local commuter train service was established almost from the outset. The Worcester Railroad ran local trains to Newton as early as 1843. The Providence line ran local trains to Dedham. Similar service was provided by the Fitchburg, the Old Colony, the Boston and Maine, and the Lowell railroads. By 1900 Boston led all cities in the country in such traffic, with more than 24 million commuter rides annually.

Although Boston was the center of 3,000 miles of railroads as early as 1880, the system never reached much beyond the boundaries of New England. Since that time, there have been no important changes in mileage of railroad operations. For Boston, the western horizon was at Albany. Boston investors financed a great many railroads throughout the country but they lacked the foresight to give their own city a direct trunk line route to Chicago and the West. As a result, the city has become only a regional, rather than a national railroad center.

The railroads not only aided Boston's industrial growth but their excellent commuter train service also made possible the dispersion of a considerable portion of Boston's population to surrounding cities and towns. Such communities as the Newtons, Winchester and Lexington have become primarily dormitory suburbs for many who work in Boston.



Development of Railroad Network

Street Car Lines

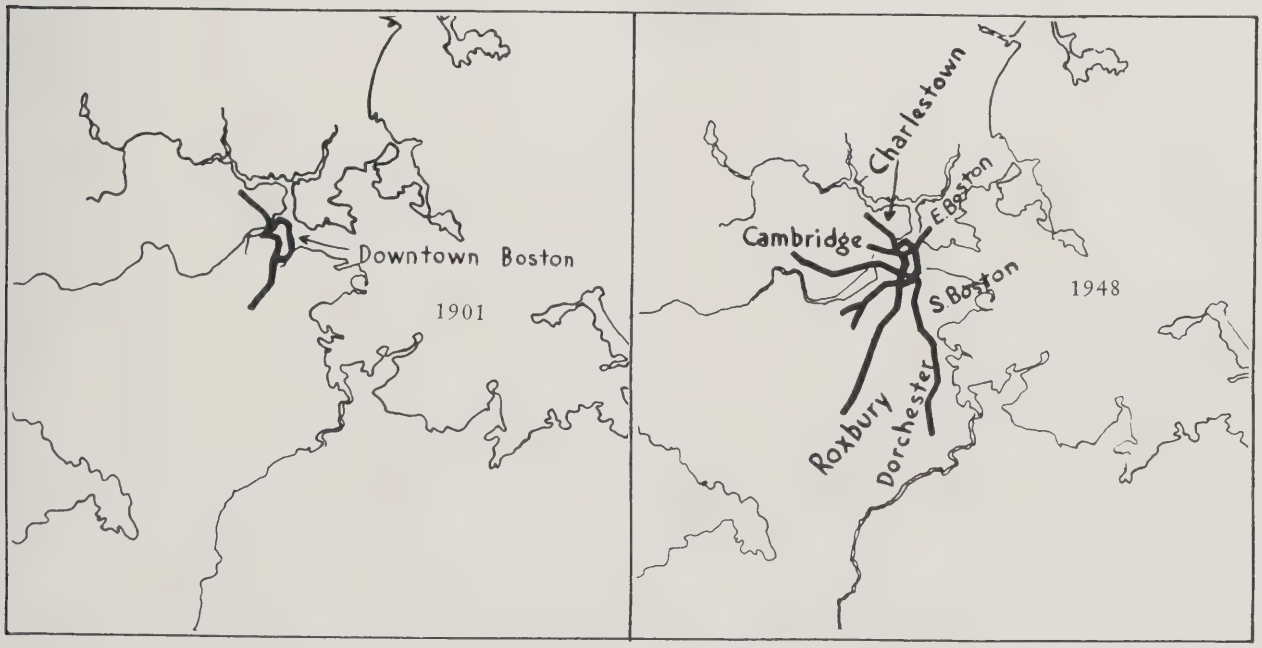
Stage coach lines, which had served the Greater Boston region fairly adequately, faced no competition until shortly after 1850 when horse-drawn street car lines were built from Boston to Roxbury, to Cambridge, and to South Boston. Within a comparatively short period, many other horse car lines were constructed to suburbs that were not served by steam railroads. These various lines were consolidated in 1887 to form the West End Street Railway. The first electric car line in the region began service in 1889. By 1897, the company had the largest street railway system in the world, both in track mileage and number of cars in operation. In that year, it was absorbed by the Boston Elevated Railway. Electrification of all lines was completed in 1900.

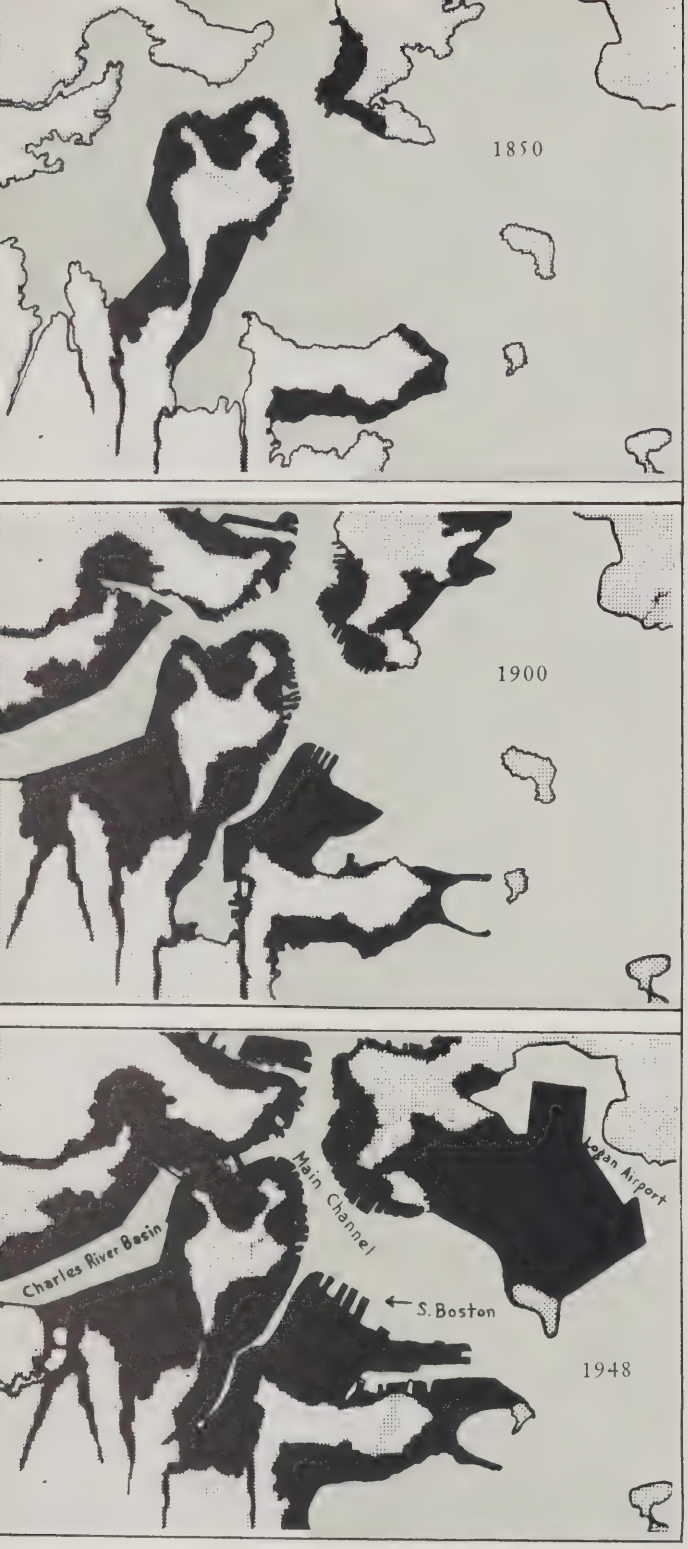
Rapid Transit

The first subway in America, the Tremont Street Subway, was opened in 1898. Since that time, Boston's rapid transit system has expanded to include the elevated line from Sullivan Square to Dudley Street (1901); East Boston Transit Tunnel (1904); Washington Street Tunnel (1908); Forest Hills Elevated Extension (1909); Cambridge Subway (1912); Boylston Street Subway to Kenmore Square (1914); Dorchester Tunnel to Andrews Square (1918); elevated from Field's Corner to Ashmont (1928); elevated from Ashmont to Mattapan (1929); Huntington Avenue Subway (1941). Comparison of the accompanying sketch maps indicates the growth of the system between 1901 and 1948.

In 1947 the State Legislature created the Metropolitan Transit Authority and dele-

Rapid Transit Network . . . . Only subways and elevateds are shown.





Boston's Changing Shore Line

Areas in black are Dry Land Created by Filling

gated to it the task of operating the elevated, bus and street car lines formerly controlled by the Boston Elevated Railway Company.

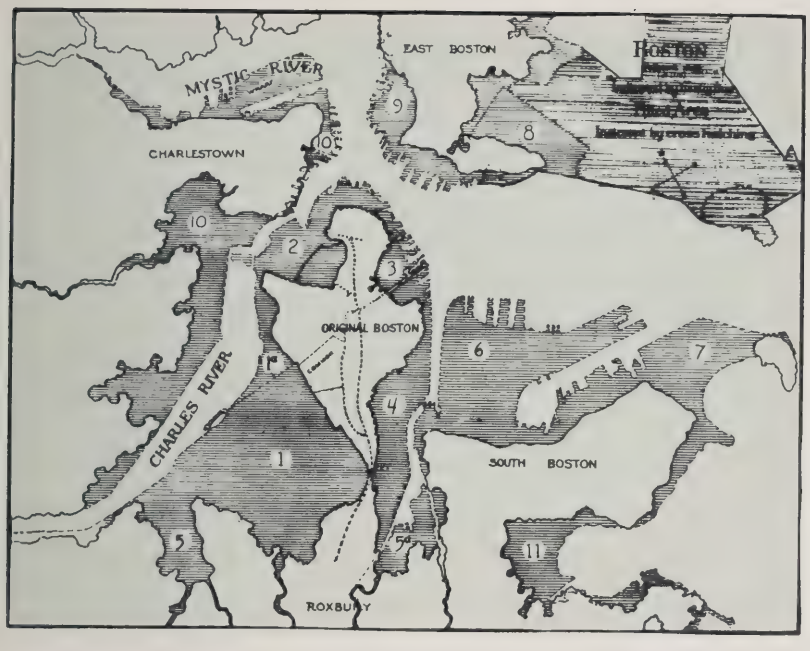
Land Reclamation

Few people realize the vast extent of land reclamation projects in Boston. The filling in of tidal marshes and shallow waters has created more than five times as much land as the 783 acres of Boston's original peninsula. It will be surprising to many to learn that not one foot of Boston's original shoreline is on the city's waterfront today (see accompanying maps).

The Back Bay and the Public Gardens were originally under water. The South Boston harbor improvements — including Commonwealth Pier, Fish Pier and the Castle Island facilities — were all constructed on so-called "made land." Logan Airport, which will cover an area three times as large as downtown Boston, also is being built on filled land.

The city's first important reclamation undertaking was completed in 1805 with the filling in of nine acres of flats, adjacent to what is now Harrison Avenue. By 1829 the city had obtained 70 more acres of land from Old Mill Cove in the North End. The next task was the filling in of the Town Dock and Great Cove at the foot of State Street. This project continued for more than 50 years and gave Boston 112 acres. By 1843, South Cove had been reclaimed to add another 186 acres. The filling in of the 80-acre West Cove was finished in 1863.

These projects were carried out in order to increase the city's building land. However the filling in of the Back Bay area was started for an entirely different reason. In 1814, the Boston and Roxbury Mill Corpor-



Adapted from Bostonian Society Map

Dry Land Created by Filling Bays, Coves and Inlets

1. Back Bay	6. South Boston
1a. West Cove	7. Marine Park
2. Mill Cove	8. Logan Airport
3. East Cove	9. East Boston
4. South Cove	10. Charlestown
5. Roxbury	and Cambridge
5a. South Bay	11. Columbus Park

ation built two dams around the Back Bay tidal marsh. These dams, with roadways on their tops, were located along Beacon Street and Brookline Avenue. Sanitary conditions in the pond created by the dams became unbearable because adjacent properties used the pond as a sewer outlet. Filling in of the entire area was imperative as a health measure and work was started in 1857. The job took nearly 40 years to complete and added 570 acres to the city. All these many reclamation projects do much to counter the generally held conviction that Boston grew aimlessly and with little thought for its future.

The lack of cheap land for normal expansion in Boston was a serious handicap to the residents of the city. Reclamation projects were expensive and resulted in increased taxes. On the other hand, land was cheap and plentiful in the suburbs and their taxes were low. As a result, many of Boston's business leaders moved their homes to Brookline, Newton, Milton, Needham, Winchester and other suburban towns.

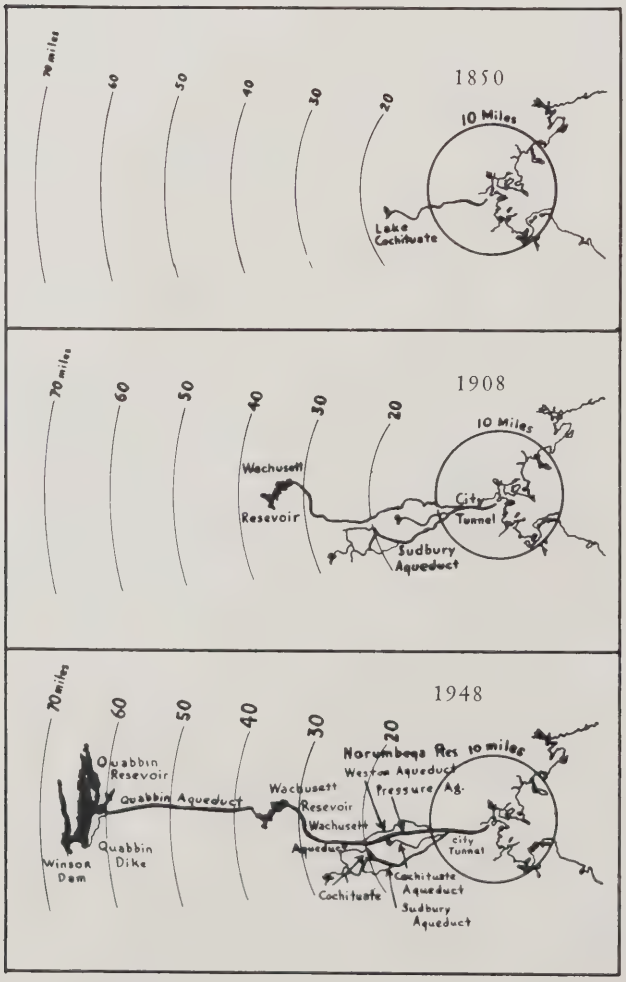
Water Supply

The Puritans first intended to locate the seat of government of their new colony in Charlestown. They chose Boston instead because Charlestown lacked an adequate water supply. The first recorded effort to obtain a good water system for Boston was in 1652 when the General Court chartered a private corporation to build a reservoir at Dock Square "to provide a supply of fresh water . . . . and especially for use in case of fire." The supply from this reservoir, which was fed only by springs in the neighborhood, soon proved insufficient.

The Jamaica Pond Aqueduct, which brought water to the city through four main pipes of pine logs, was built by another private corporation chartered in 1795. This water supply also became inadequate to meet the needs of the growing city.

As a result of a survey authorized by the Council, work was begun in 1846 on the Cochituate (Long Pond) water system in Wayland. The new public waterworks were opened in 1848 and within three years every

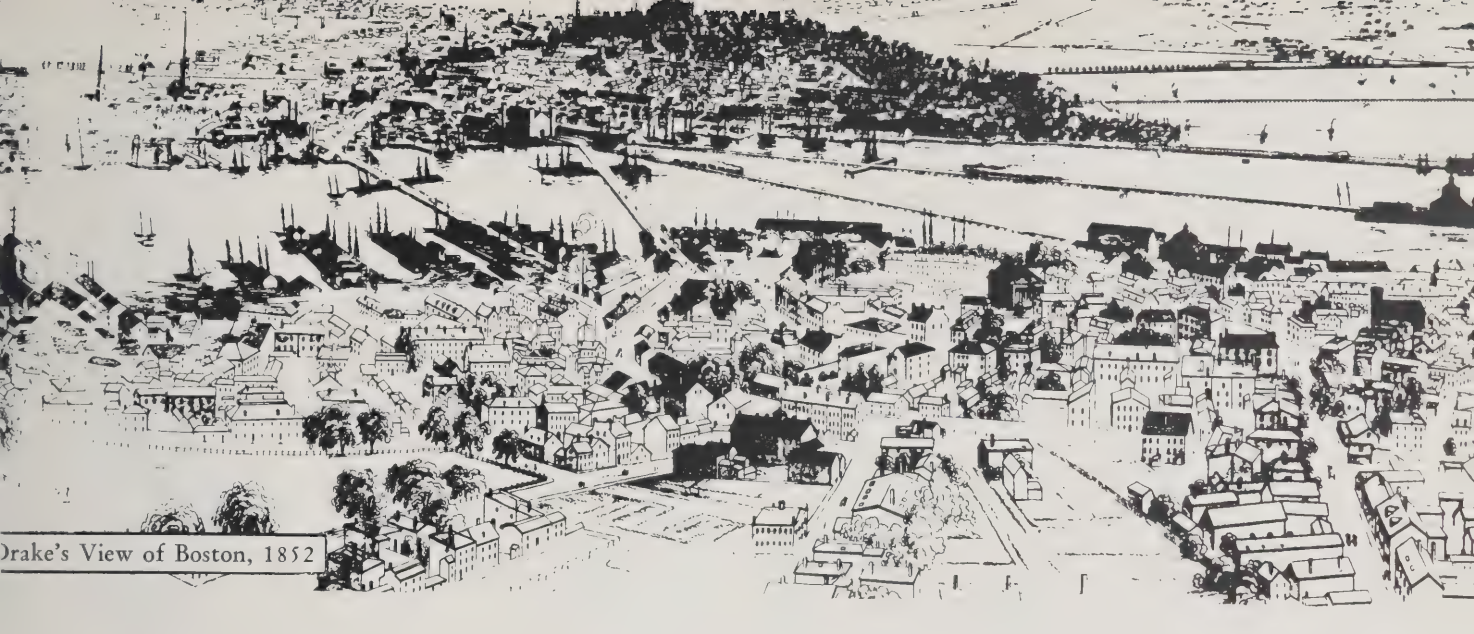
Greater Boston Reaches out for Its Water Supply



section of Boston was supplied with pure water.

The Long Pond source was augmented in 1878 when water from the Sudbury River was channeled into Chestnut Hill Reservoir. In 1895, the State Legislature created the Metropolitan Water District. Its governing board purchased the various storage reservoirs and aqueducts from the City of Boston; acquired Spot Pond from the cities of Malden, Melrose and Medford; and then completed the Sudbury reservoirs. The Wachusett reservoir on the Nashua River came into use as part of the metropolitan system in 1908.

The Metropolitan District Water Supply Commission virtually completed its monumental task of giving the Boston area one of the finest water systems in the world. Its duties were taken over by the present Metropolitan District Commission in 1947. Engineers of the Water Division of the Metropolitan District Commission estimate that the existing supply will be sufficient to cope with demands of the Metropolitan Water District for the next 100 years. This system is also capable of furnishing water to many other cities and towns outside the



Drake's View of Boston, 1852

district without serious drain upon the supply. Chicopee in western Massachusetts has already contracted for water from Quabbin.

Sewerage Systems

Boston had no public sewerage system for more than 200 years. During all this time, the city sought to discharge its waste through private sewers. These proved unsatisfactory, usually because they did not extend far enough into the harbor. The sewage frequently backed up over the city's low-lying marshes and flats, creating a grave menace to public health.

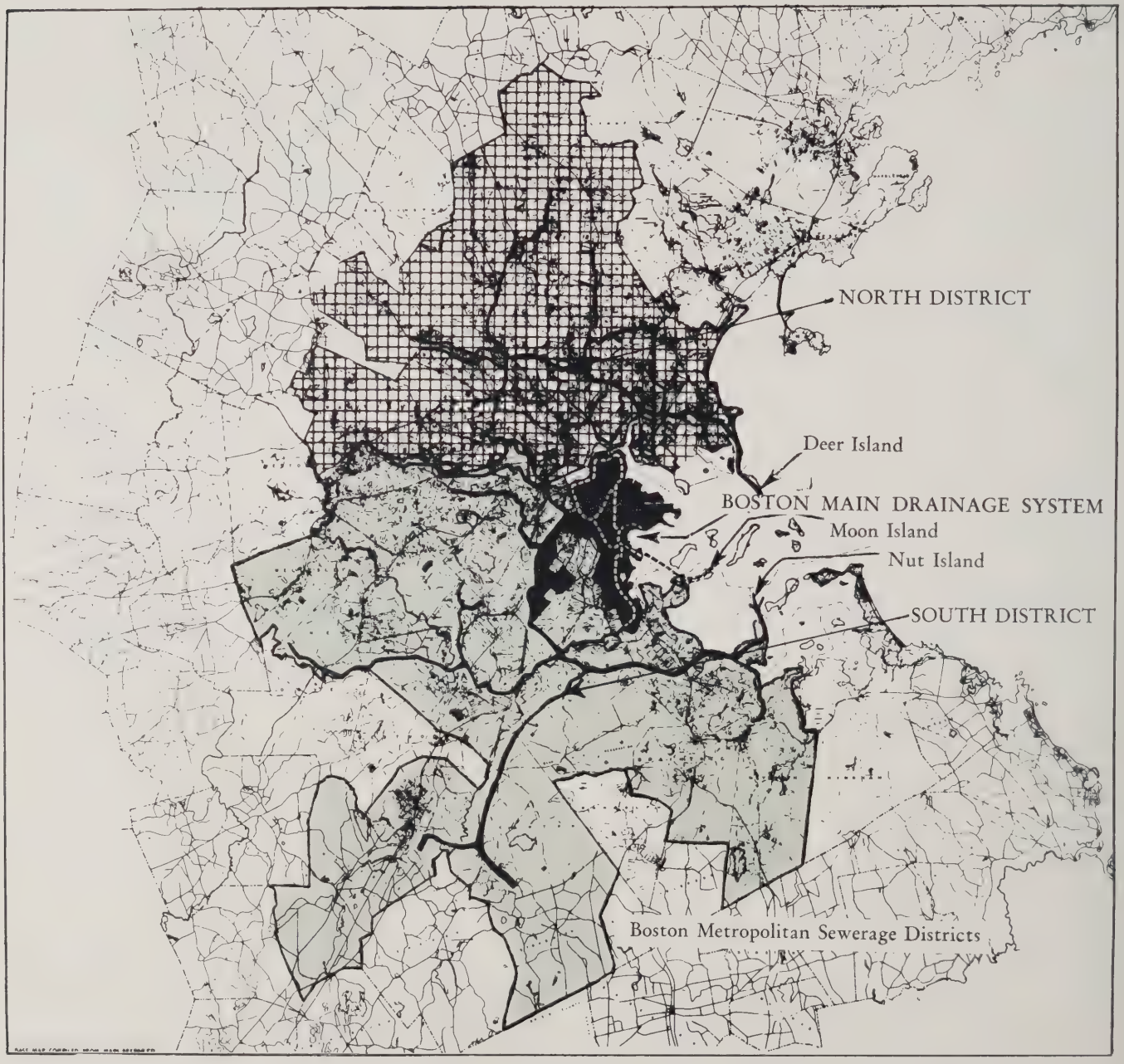
In 1868, the Massachusetts State Board of Health, the first such board in the country, was established to deal with the unsanitary conditions in the Boston drainage basin. Soon after, the City of Boston also created a commission to study the problem. As a result of this commission's report, the Boston Main Drainage System was built between 1876 and 1885 to handle sewage from Boston proper and parts of Brookline, Roxbury, Dorchester and South Boston. The commission also recommended construction of a northerly system embracing Charlestown, East Boston and adjacent communities, but objections from the outlying towns prevented this plan from being carried out.

In 1889, at the urging of the State Board of Health, the Legislature created the Metropolitan Sewerage District. The commission in charge of the district built the two main branches of the present metropolitan sewerage system. The north branch passes through Charlestown and East Boston and 17 cities and towns north of Boston. The south branch extends through Brighton,

Metropolitan District Commission

Quabbin Reservoir . . . . 415,000,000,000 gallons of water

Boston's Sewage Disposal Plan . . . . The North and South Sewerage Districts are operated by the Metropolitan District Commission; and the Boston Main Drainage System by the City of Boston.



Hyde Park and parts of Back Bay, Roxbury, West Roxbury and Dorchester as well as 15 other cities and towns. The areas served are indicated on the accompanying map. Both systems discharge into the harbor, the northerly outlet at Deer Island and the southerly at Nut Island, off the Quincy shore.

The northerly and southerly systems are now in charge of the Metropolitan District Commission. The Boston Main Drainage System with its outlet at Moon Island, is operated by the City of Boston's Public Works Department. The locations of these

outlets are shown on the photograph of a topographic model.

These three systems each discharge approximately 100,000,000 gallons of untreated sewage into Boston harbor daily. Pollution of the harbor has been the inevitable result, with consequent fouling of public bathing beaches, and destruction of shellfish areas and fish life.

To protect public health, the Metropolitan District Commission is completing a $5,500,000 treatment plant at the Nut Island outlet. At this plant, sewage will be treated to render it harmless. Preliminary plans for another plant at the Deer Island outlet are being prepared. The City of Boston also proposes to build a treatment plant at its Moon Island outlet. It is estimated that these three treatment plants, with minor changes, will be able to cope with all sewage from the metropolitan area for the next 40 years.

Antique Views of Boston

Boston Harbor in 1768 . . . . This interesting view was originally engraved by Paul Revere.

Boston Harbor in 1730 . . . . Long Wharf shows at center.

Antique Views of Boston

Metropolitan District Commission

Building an Aqueduct . . . . A new link in Boston's water supply — large enough for a street car.

Geological Museum, Harvard University

Topographic Model of Boston Harbor . . . . The sites of sewage treatment plants are marked. The Nut Island plant is under construction. Work on the other two has not yet been started.

Economic Development of Greater Boston

The early commerce of the Boston region naturally converged on the port because it was there that farm produce and manufactured goods could most easily be exchanged for needed British imports. England, however, made these exchanges difficult by placing harsh restrictions on colonial trade. It forbade the manufacture of iron and steel in the colonies and refused to permit shipment to England of grain, sugar, fish and rum. It also levied heavy duties upon American importation of such commodities as glass, paper, paint and tea. To relieve their difficulties and obtain needed money and credits, the Boston merchants developed a thriving trade with the West Indies. The English trade restrictions bore heavily on the freedom-loving colonists and helped fan the flames of the American Revolution.

Before the beginning of the 19th Century, Boston's economic prosperity was based

Research on the Banks of the Charles River

National Research Corporation — *Cambridge Chamber of Commerce*

B. B. Chemical Company — *Cheyne Aerial Surveys*

Massachusetts Institute of Technology, Cambridge

primarily on shipping, agriculture and the fishing industry. Its manufactures were mainly limited to products needed for local consumption. These included clothing, shoes, furniture and other goods not easily obtainable from England. Exports comprised mostly timber, turpentine, tar and pitch, barrels, dried fish, whale oil and furs.

The temporary crippling of New England's sea-borne commerce during the War of 1812 and later during the Civil War hastened the industrialization of the Boston region. With foreign trade cut off, Boston turned to manufacturing numerous articles that had previously been imported. The necessity of helping equip the Union Army during the Civil War also created a huge demand for manufactured products. Boston soon became the nation's shoe and leather center and the leading wool market in the country. Today, the largest employer of labor in the City of Boston is the apparel industry — coats, suits, dresses, sweaters, skirts, rainy weather outfits, etc.

The region has grown to be one of the three great rubber manufacturing centers in the United States. Printing and publishing and the allied trades of book-binding, photo-engraving and lithographing, play a prominent part in Boston's industrial life. Production and distribution of food also are exceedingly important. Other leading manufactures include high grade cotton, machinery, electrical equipment, candy, soap, chemicals, watches and clocks, clothing and the processing of coffee.

As a banking center, Boston has been traditionally aggressive. It has supplied enormous capital not only for industrial expansion in New England but also in the South and West. The city ranks as the third most important financial center in the United States.

Tufts College, Medford . . . . Ballon Hall — oldest edifice on the campus.

Boston University . . . . College of Liberal Arts, Graduate School and Central Admissions office. *Egan Photo Service*

Educational Resources

America's educational system began in Boston. The first free public school in the United States was established here in 1635, only five years after the Puritans landed. This was the Latin Grammar School, now called the Public Latin School. The Boston region is also the home of the nation's oldest university, Harvard, which was founded in 1636.

The legal foundation for the American public school system was laid in Boston in 1642 and 1647 with the adoption of the so-called "general school laws." This legislation sanctioned the establishment of schools for the general public, and stipulated that their operating expenses be met from public tax funds.

Today Boston has become one of the world's foremost cultural and educational centers, rich in the resources and facilities which contribute to progress in the arts and sciences, industry and finance. More

Northeastern University Campus . . . . Three of these modern college buildings have been completed.

Simmons College, Boston . . . . The Administration Building

Boston College, Newton . . . . Chestnut Hill reservoir is in background. *Fairchild Aerial Surveys, Inc.*

The Harvard School of Business Administration . . . . In the background across the Charles River are the main groups of Harvard buildings. *Fairchild Aerial Surveys, Inc.*

than 40 universities and colleges are located in the metropolitan area. A large number of research laboratories are also maintained by industrial corporations.

There are well over 200 public libraries in the region, with a total of nearly 5,000,000 books on their shelves. The Boston Public Library boasts the largest book circulation of any library in America in proportion to city population. The forerunner of the Boston Public Library is the famous Boston Atheneum, which has the greatest private collection of books in the United States outside of a college or university.

The city is one of the nation's music centers. The Boston Symphony ranks with the leading orchestras in the world. Boston also has the oldest choral group in the nation, the Handel and Haydn Society.

Among the city's noted museums are the Museum of Fine Arts, the Children's Museum, New England Museum of Natural History, Isabella Stewart Gardner Museum and the Institute of Contemporary Art.

Robert D. Wild

Radcliffe College, Cambridge . . . . Library at left and Agassiz House at right.

Ewing Galloway, N.Y.

Wellesley College Campus . . . . Tower Court dormitory is in background.

II.

THE PEOPLE OF GREATER BOSTON

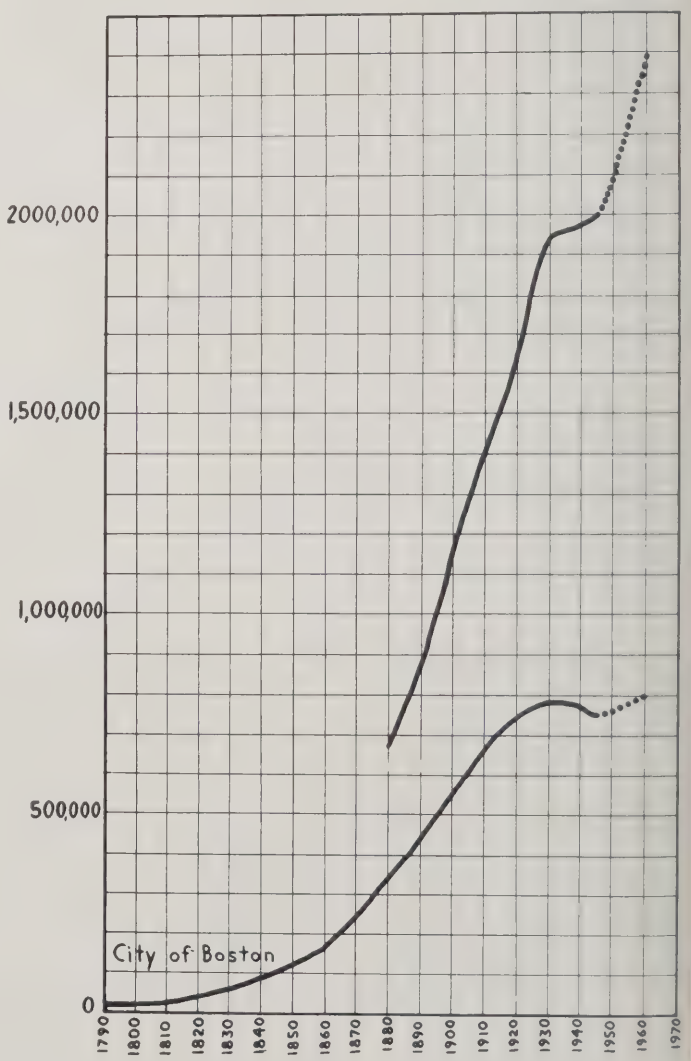
Population Growth, City of Boston

Boston, with a population of 770,816 is the ninth largest city in the United States.[1] As can be seen from the accompanying diagram, it grew most rapidly in the 50 years between 1860 and 1910. These were the years of heavy immigration from abroad. During this period, the population increased nearly a half million — from 177,840 to 670,585.

From 1910 to 1930, the city continued to grow, but at a less rapid rate. The year 1930 marked a peak in the city's population — an all-time high of 781,188. The moderate decline of about 10,300 in the next 10 years is believed to have been caused principally by the depression. The state census of 1945 recorded a further decline of 4,500. However, these two decreases were temporary, as the post-war trend is moderately upward. It seems likely that Boston will surpass its former peak and reach a total of about 800,000 by 1960.

It is, of course, very difficult to foresee whether Boston will keep on growing indefinitely, or whether future population increases are more likely to take place in the metropolitan area outside the city limits. The latter seems more logical, because so many families are continuing to move to suburban towns where they can enjoy some of the spaciousness of open country. This "decentralization trend" has been discussed at the beginning of Chapter III, Part I. It is not just a Boston trend. All large cities are experiencing the same draining away of population from central to suburban areas.

Population Growth of Boston and Its Metropolitan District . . . . The District, to which the upper curve refers, consists of the 43 cities and towns in the Metropolitan District Commission territory.



[1] U. S. Census, 1940.

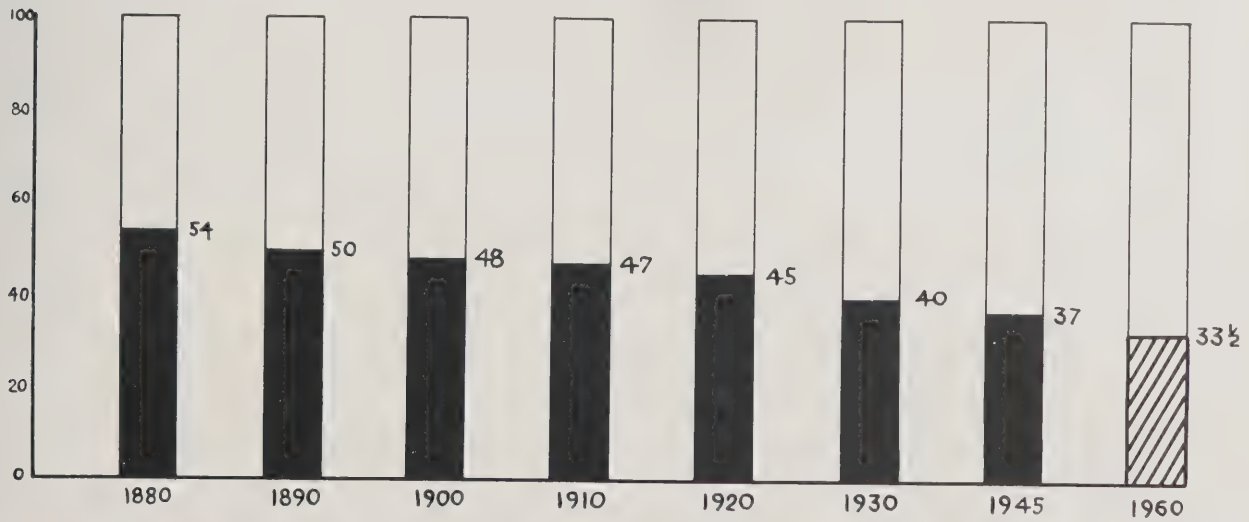
Population of Boston and Its Metropolitan District

The land area of the City of Boston is only 44 square miles — much smaller than most great American cities. The city is nevertheless the center of a very large and populous metropolitan region, consisting of many separate and independent communities. Because of Boston's small area, there is a much larger proportion of the regional population living outside the city limits than in the case of New York, Chicago, Los Angeles, and other metropolises. It is therefore not surprising that the Boston metropolitan district, as defined by the U. S. census, ranks as high as fifth in population although the city, as previously pointed out, holds only ninth place.

The area under the jurisdiction of the Metropolitan District Commission[1] covers 472 square miles — nearly 11 times the size of Boston. It embraces 43 cities and towns, including Boston. In 1940, their combined population was 1,980,221. This represented an *increase* of 25,000 over the 1930 figure, achieved during a decade when the City of Boston's population was actually decreasing[2] (see diagram).

As the diagram shows, the Metropolitan District has been growing consistently faster than Boston. (The relative steepness of the curves indicates the rates of growth.) Back in 1880, the Metropolitan District had a population of 674,021. Almost 54 per cent of this total lived in the City of Boston. But since then, the proportion within the city has been falling steadily. It was down to 48 per cent in 1900; 45 per cent in 1920; and a mere 37 per cent in 1945.[3] These changes are shown graphically on the adjacent chart. It is expected that by 1960 the Metropolitan District population will be about 2,400,000, of which roughly one-third will be living in Boston.

Boston's Proportion of the Metropolitan District Population . . . . It has dropped from 54 per cent in 1880 to 37 per cent in 1945



[1] See page 256 for further description of the Metropolitan District.

[2] Between 1930 and 1940, five other municipalities, all adjacent to Boston, also declined in population: Cambridge, Chelsea, Everett, Revere and Somerville.

[3] These figures are for the 43 cities and towns. The U. S. Census Bureau defines Metropolitan Boston as including 83 cities and towns, instead of the 43 in the Metropolitan District Commission's territory. The additional 40 towns form an outer ring and had a combined population of only 370,000 in 1940. If we use the U. S. Census definition, the City of Boston's 1940 proportion of the metropolitan population becomes only 33.5 per cent. The boundaries of both these metropolitan areas are shown on the map on page 258.

Population of Metropolitan District and Massachusetts

The population of Massachusetts was 4,493,281 in 1945. Although the Metropolitan District covers only one-sixth of the state's area, nearly half (46 per cent) of all Massachusetts residents were then living in the 43 cities and towns of the district. The seats in the House of Representatives of the Legislature are apportioned on the basis of population. It is significant from a political and civic standpoint that the people living in the district elect nearly as many representatives as all the rest of the Commonwealth combined (108 as compared with 132). This fact is illustrated by the accompanying drawing of the State House.

Metropolitan District's Proportion of Massachusetts Population.

Natural Increase of Population

If nobody ever moved in or out of the Metropolitan District, its population would still continue to increase because more people are born than die each year. This excess of births over deaths is called the "natural increase of population." For the period 1940 to 1945, this natural increase in the district was at the rate of eight persons per 1000 population per year. At this rate, the district would increase only about 164,000 between 1940 and 1950. It will almost certainly grow more than this, because many people will move in from other parts of the country — far more than will move away.

National Origins of Greater Boston's Population

As shown on the adjacent chart, 77 per cent of the City of Boston's people were born in the United States. Another 14 per cent are naturalized citizens. Less than 10 per cent of Boston's populace is of alien citizenship.

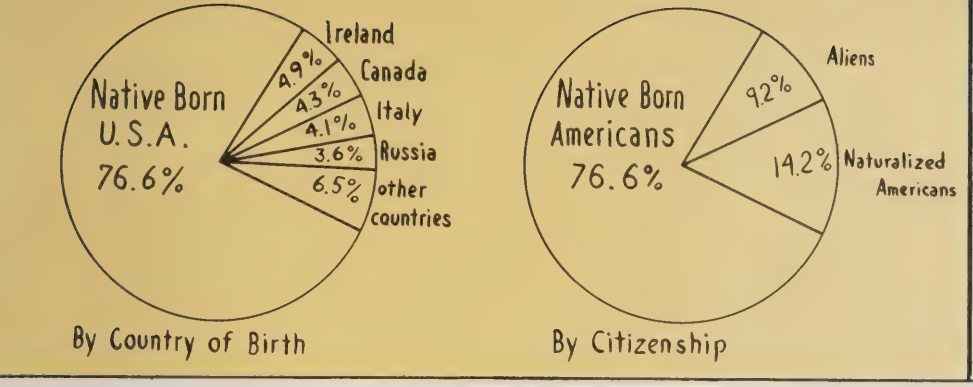
A great many of Boston's early settlers came from Ireland. It is their descendants who account for the large number of Irish names in Boston today. In 1940, there were only 37,507 Irish-born men, women and children in the city[1] — less than five per cent of the total population — and far more than half of these were naturalized Americans.

The other principal foreign-born groups in Boston are Canadians (4.3 per cent), Italians (4.1 per cent), and Russians (3.6 per cent). No other single foreign nationality accounts for even one per cent of the city's population.

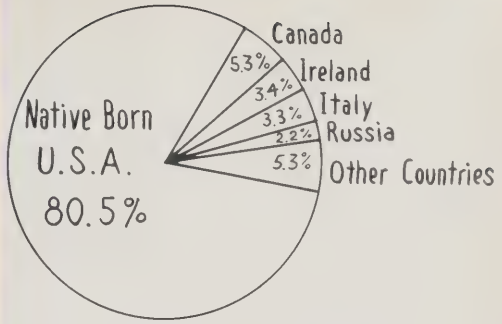
If we consider the U. S. Census Metropolitan District,[2] rather than just the City of Boston, it is interesting that the Canadians make up by far the largest foreign-born group. In 1940, they numbered over 124,000 out of a total population of 2,350,514. Natives of the Irish Free State (Eire) and Northern Ireland together totalled 80,518, which was only 3.4 per cent of the region's population.

[1] This figure includes natives of both the Irish Free State (Eire) and Northern Ireland.

[2] See footnote 3 on page 175



Boston's Population, Analyzed by Country of Birth and by Citizenship.



The Metropolitan District's Population, Analyzed by Country of Birth.

Immigration from Abroad

The number of foreign-born residents of the United States is decreasing every year. The federal government sharply reduced immigration quotas in 1924, and ever since has permitted only a small trickle of immigrants to enter the country. Meantime the older foreign-born residents have gradually been dying, leaving children who are native Americans. Not only Boston but the entire United States may have an almost 100 per cent American-born population within 30 or 40 years unless, of course, there should be some major change in national immigration policy. Since 1924, the small increase of population due to immigration from abroad has been nearly balanced by emigration of aliens back to their home countries. Foreign immigration is no longer an important factor in population growth of the United States.

Internal Migration

A city or region may also grow by attracting people from other parts of the same country. This is called "internal migration." There is evidence that the Boston region and in fact all of New England, are growing in this way. For a great many years, there has been a general trend away from the agricultural and mining areas of the country and toward the manufacturing centers. This trend is beneficial to New England, and especially to the Boston region, where so much industry is concentrated.

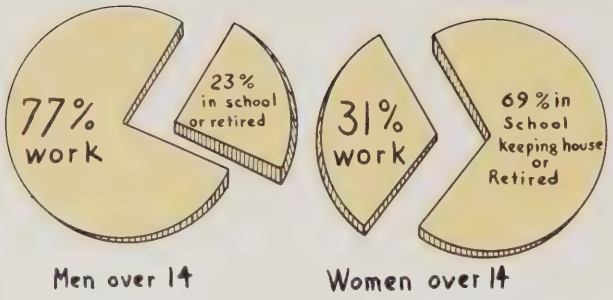
Between 1940 and 1946, the total population of New England is estimated to have increased by over 607,000, of which more than 423,000 represented internal migration from other parts of the country.[1] The balance of the gain was due to the "natural increase" of population.

It is also very significant that New England, in April 1947, had 4.7 per cent more resident veterans than the number who entered the armed services from New England addresses. Veterans have apparently chosen this part of the country as a particularly desirable place to live because of its economic and other advantages.[2]

If Boston and its surrounding cities and towns offer better opportunities than other sections of the country, they will continue to attract population from less advantageous areas. These better opportunities must be more than merely jobs at good wages. They must also include good homes and neighborhoods; good recreational facilities; uncrowded schools; and comparatively reasonable living costs. The Boston region must compete in every one of these fields with the other great manufacturing centers of the nation.

[1] U. S. Bureau of the Census data, reported in Monthly Review, Federal Reserve Bank of Boston, August 1947.

[2] Monthly Review, Federal Reserve Bank of Boston, December 1947. The Pacific States (especially California) also have an increase of resident veterans. The Central, Southern and Rocky Mountain regions of the United States have experienced decreases.



Metropolitan Boston's Labor Force . . . Seventy-seven per cent of the men work and 31 per cent of the women.

Working Population

The United States Census tells us that the Metropolitan District's "labor force" numbered 995,153 in 1940, or 53 per cent of the people who were 14 years of age and over. The "labor force" consists of all men and women who are actually working for a living or who are seeking work (see chart). Somewhat over two-thirds of the labor force is composed of men, as most married women take care of their homes and families instead of going out to earn a living. However, the number and proportion of employed women have been increasing.

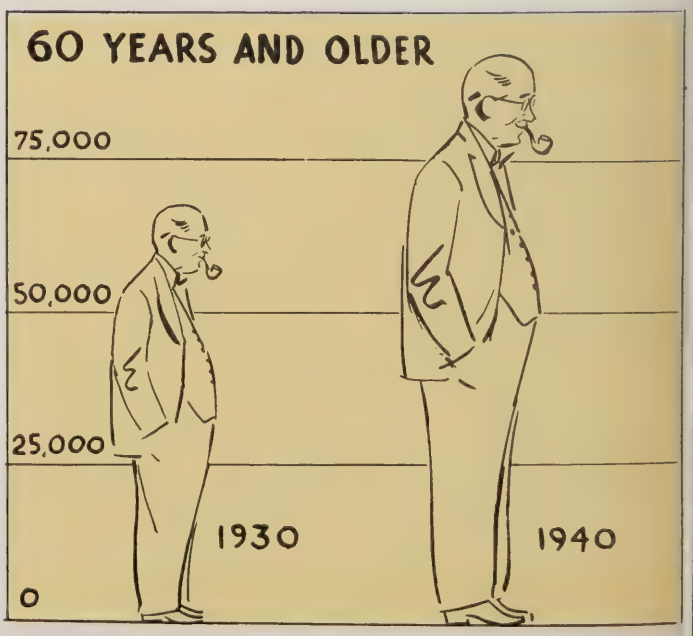
Increasing Age of the Population

As the direct result of modern advances in medical science, people live much longer than their forbears. Better surgery, greater knowledge of the treatment of disease, and the discovery of new medicines such as the sulpha drugs and penicillin all contribute to prolonging life. Consequently, our cities now have a much larger proportion of older people than in earlier years. This change is becoming very marked indeed. Boston, for example, in the brief 10-year period from 1930 to 1940, showed an increase of 33 per cent in the number of people 60 years of age or older! In 1930, the figure was 70,357; and in 1940 it had risen to 93,859 (see illustration). By 1950, the number will again be very much higher.

This increase in the number of old people directly affects planning for many public facilities. Boston will need more community centers, club houses and reading rooms for the use of the older generation. It will need more quiet neighborhood parks. And more homes will have to have extra bedrooms for grandparents. The young people of today will have much heavier responsibilities in caring for the "old folks" than was usual in their fathers' and grandfathers' times.

There are also more people of middle age than ever before. The men in this group, and a fair proportion of the women, are part of the labor force. It is essential that there be far more employment opportunities for these workers of 45 to 60 years of age than have been available in the past.

More Old People Today



We speak of our "aging population" not only because there are more old and middle-aged people than there used to be, but because there are fewer young people. The number of boys and girls of 19 and under, in Boston, declined more than 29,000 between 1930 and 1940. Should this decline continue it would greatly affect the size and number of schools needed in Boston. However, recent indications are that this downward trend has already reversed itself and that we may soon have as large a "school population" as we did 20 years ago. In any event, the decline would not affect high school seating requirements, as the increasing *proportion* of 'teen-agers going to high school will offset any possible falling off in the total number in this age group.

Planning for Future Population Needs

Not only parks and schools, but projects such as highways, rapid transit systems, housing developments and business centers have to be planned in advance for the number and kind of people who will live in the Boston region 10, 20 and 30 years from now. The population trends indicated in this chapter give us valuable signposts pointing toward the future.

All the cities and towns of the region are going to seem different in another twenty years. They must actually *be* different in the environment they offer for homes, work, and play if they are to provide properly for the needs of their different population. The young people who are now in school will have a great deal to say about obtaining the physical improvements that are going to be necessary. This will be their own Greater Boston, to make over for themselves, for their aging parents and for their growing children.

Fewer Young People Today

III.

PLANNING FOR RESIDENTIAL DEVELOPMENT

Locations for Living

As a place to live, the Boston area has great advantages. Few large American cities have as many conveniently located parks and bathing beaches. Few cities can point to so many fine museums, art galleries and libraries. Boston has been richly endowed by Nature, and Man has developed exceptional resources for recreation and culture. But the city also suffers from many shortcomings — particularly in its lack of sufficient good places to live. Boston is not alone in this respect. All great cities have their areas of poor housing; all are face to face with the same problem of building better homes for the future. In fact, though Boston has some badly run-down neighborhoods, it is no worse than most other large cities.

If we go for a long walk around Boston, we see a great many residential neighborhoods: some have mostly single family homes; others, two-family houses; and others, wooden "three-deckers." In some neighborhoods, we find run-down brick tenements; and in a few areas, modern apartment houses. We also come upon districts of office buildings and stores, and other areas where there are big manufacturing plants. Our walk takes us along many miles of streets and through some of the city's parks and past its libraries, museums and churches. In this way, we see the principal *land uses* of the city: residence, business, industry, streets, recreation, and public and semi-public buildings.

It is possible to make a map showing how all the land is used today. A master plan for *future* land use can also be prepared for Boston, indicating how the land should best be used in the years to come. Large areas would of course be set aside exclusively for residential purposes; and each of the other land uses would have its appropriate locations. Housing, business and industry would be kept apart so as not to conflict with one another. When possible, parks would separate residential from industrial districts.

Then, as old buildings are torn down and new ones put up, we would gradually carry out this master plan for land use by building the right things in the right places. Within two or three generations, we would have a city constructed according to the plan. That may seem a long time to wait — but each year would be a year of progress; and every young person of today would see much of the plan fulfilled. Unfortunately, the Boston Planning Board has not yet been able to make this land use master plan for lack of sufficient funds for the necessary technical staff and expert consultants.

The sooner the plan is made, the sooner the people of Boston will know what the city of the future should be like. We all take pride in our City of Boston — pride in its past and in its present. Let us do all we can to stimulate pride in its future.

Greater Boston Housing Types

Most of us know fairly well what the residential areas of Boston and its surrounding towns are like today. This book cannot describe the many individual neighborhoods and communities. It is interesting to discuss here some of the very typical kinds of housing that have been erected in the past. Many residential sections are built up with houses that are now old and are of types that would not be built again. It is worth noting, however, that even these neighborhoods contain many individual good houses.

In some old areas, a common type of housing is the four or five-story brick tenement that covers nearly all its lot, leaving very little land for a rear yard and none for side yards. These buildings have small, dark rooms ventilated only by interior light shafts or narrow courts. Many of their bedrooms — and sometimes living rooms as well — have no outside windows. Most of these out-of-date tenements were built between 1870 and 1890 to house the new immigrants arriving from the old countries across the Atlantic. They are much like the tenements of New York's Lower East Side. Even when new they were not satisfactory because too many families were crowded into too little space.

Another type of housing is the three-story wooden flat popularly known as the "three-decker." Its construction dates back to between 1890 and 1915. The owner usually lived on one floor and rented the other two. He thus received an income from his property and at the same time was present to take care of it. Because of cheap materials and poor construction, these buildings usually deteriorated rapidly when the owners moved away, as they were no longer well maintained. The three-deckers were generally built too close together. Rooms on the sides get little if any sun and not enough light and ventilation.

An earlier Boston house — of the period between 1845 and 1885 — is the single family mansion of four or five stories, built solidly against the houses on each side of it. For this reason, it is commonly called a "row house." Modern row houses have windows in every room, but these older examples often have rooms without windows. Their kitchens are in the basement, for they were originally designed for families able to afford servants. In recent years they have been

"Three-Deckers" *Boston Housing Authority*

Factory in Residential Area . . . . Housing, business and industry should be set apart from each other.

Typical Boston Housing

remodelled into apartments, or used as rooming houses. Relatively few of these great houses of the past are still occupied by only one family.

More than 100 years ago, the typical Boston home was a single family brick row house of two and one-half stories. Like the best modern row houses, they had one room in front and a second room in the rear, but no dark interior rooms. They are more easily converted into attractive apartments than the large mansions. Many of these houses are still in good condition today.

Certain sections of Boston, including the South End and Charlestown, are close to railroad lines and yards. They have suffered from the smoke and noise of trains.

In Cambridge, the older houses are quite usually built of wood rather than the red brick so characteristic of Boston. Cambridge also has a smaller proportion of row houses, and more homes on good-sized lots with windows looking out on all four sides. In the past 25 years, many modern elevator apartments also have been constructed.

Brookline has the greatest development of modern apartment houses in the region — principally along Beacon and adjacent streets. Another characteristic of Brookline is the prevalence of large private houses with extensive grounds.

As would be expected, the residential areas that are most convenient to downtown Boston have been the most densely built up. Residential concentration, in the form of apartment houses, row houses and tenements extends out along the principal transit routes. It is in such locations that the land is most valuable. By contrast, single family homes with their own gardens greatly predominate in cities and towns beyond the transit routes — in Dedham, Newton, Belmont, Winchester, Melrose, Saugus and more distant communities. From these homes commuters generally travel to their work by railroad, bus or private automobile.

Typical Boston Housing

Housing Types of the Future

Architects designing the homes of tomorrow are eager to build greatly improved housing where living will be easier and more healthful. They are thinking of four principal types:

(a) Elevator apartment houses, six or more stories high, with outside windows in every room and plenty of open space on all sides to assure a maximum of sunlight and daylight. Every apartment would have windows facing in at least two directions so as to obtain good ventilation through the rooms. The buildings would be grouped on large blocks of several acres. About two-thirds of the land area would be left vacant, to be used for grass plots, play space, paths and private driveways.

(b) Apartment houses without elevators and not over three stories high. In every other respect their layout would be similar to the elevator apartment houses.

(c) Modern row houses, 15 to 30 feet wide, two stories high, and only two rooms deep. These houses would have private front and rear gardens.

(d) Single family houses on lots 60 feet or more wide so as to be well separated from the houses next door. They would thus have good light and a view from all four sides.

Greater Boston Housing Facts and Figures

Boston is mostly a city of rent-payers. Almost four out of every five families are tenants rather than home-owners. Most people live in multi-family houses — that is, apartments, tenements, three-deckers and remodelled row houses. In the whole metropolitan Boston region, 58 percent of the families are rent-payers.

Blight and Decay *Boston Housing Authority*

Boston is also a city of old houses. About four out of every 10 families live in buildings constructed before 1900. Almost the same percentage applies for the region. Old age does not necessarily mean poor condition, but it usually indicates that the houses are of obsolete design — not the kind of houses that would be built today.

In 1940, it was found that one out of every five homes in Boston needed major repairs or lacked a private bathtub or private toilet. Such houses are rated as "substandard." Lack of central heat, insufficient light and air, and overcrowded living quarters are also substandard conditions that need to be remedied. For the region as a whole, the record is better — only one out of eight homes is substandard.

Relieving the Housing Shortage

With so much worn-out and obsolete housing in Boston, it is clear that the people of the city face the challenging task of having to rebuild the old neighborhoods. But first there is another challenge, a more immediate task of even greater urgency. Never before has there been such a critical shortage of places to live. Not much new housing was built during the depression years of the 1930's. Then came the war. No homes were built at all except a small number for war workers. All the vacant houses and apartments were absorbed; the few new homes were immediately occupied; and many families were obliged to double up with relatives. Since the return of men from the armed services the situation has become very much worse.

The post-war housing shortage is Boston's — and America's — first and most critical

problem. Rebuilding old neighborhoods, on the other hand, is a long-range obligation. It cannot be undertaken extensively until vacant homes are available somewhere else to re-house, at least temporarily, the families in the areas to be torn down and rebuilt. Let us therefore first consider the solutions of the present housing emergency; and then discuss future opportunities for replacing entire neighborhoods of old houses.

Extent of the Housing Shortage: The Housing Association of Metropolitan Boston has made a careful study of the housing emergency. It reported that the metropolitan area was short 97,000 homes in January, 1948. Of this number, 73,500 represent families inadequately housed in substandard quarters — this is the long-range replacement problem. The balance of 23,500 is accounted for by families doubled up, plus a small allowance for vacant quarters that should always be available in normal times. These figures do not include any provision for additional families that move into the Boston area from other parts of the country.

Private Construction: The building industry had a disappointing year in 1946 due to shortages of materials. In 1947, however, the private builders made great strides. Construction for 1948 is confidently expected to exceed any previous year in the nation's history. In the Metropolitan District (43 cities and towns), about 2,500 houses and apartments were completed by private enterprise in 1946; and roughly 8,000 in 1947. The estimate for 1948 is at least 9,000. Small homes that used to take six months to build are now being finished in less than half that time.

Most of the new private construction in 1946 and 1947 consisted of single family houses built for sale rather than for rent. A very great deal of the demand, particularly by young veterans' families, is for quarters available for rent.

Recent private rental projects include apartment house developments for 308 families in Watertown, 95 families in Quincy, and several in other cities and towns for 50 or more families each. A typical group of new apartment houses is illustrated.

New Private Housing Development in Newton Center

Fay Foto Service

John Hancock Village

Another important rental undertaking, also illustrated, is Hancock Village, situated on the border of West Roxbury and Brookline. Financed, constructed and managed by the John Hancock Mutual Life Insurance Company, it points the way toward a most desirable type of large-scale permanent housing investment, comparable in character to developments in New York (see page 78). Its great size — about 100 acres of land for 789 families — has made it possible to achieve an attractive neighborhood layout, with park areas and play space for children. All the homes are modern row houses with two floors. Veterans of World War II are given priority as tenants. The village plan provides for a local shopping center and motion picture theater.

Some of the demand for rental quarters is being met by apartments becoming vacant when their tenants move into new homes that they have purchased. One new home can create a chain of vacancies, as successive families move to more suitable quarters. This process is called the "filtering down" of dwelling units. Until more housing can be built and rented from $40 to $60 per month, filtering down is the only way to provide homes for veterans with modest incomes, except for government to do the building and stand the loss involved in maintaining low rents.

Temporary Government Housing: A step taken in 1946 to relieve the housing shortage was the erection of temporary houses — Quonset Huts, converted barracks, and other types. These were supplied by the federal government from surplus war stocks. Cities, towns, universities and other institutions provided the land and arranged for water and sewer connections. About 2,150 of these homes were set up in the Boston Metropolitan District. As a temporary means of meeting the emergency, they are reasonably satisfactory.

Permanent Houses Constructed by Local Governments: The years 1946 and 1947 also saw the start of a rental housing program for veterans of World War II, undertaken by cities and towns under supervision of the

Willi Sar

Louisburg Square, Beacon Hill . . . . The houses are typical of old Boston architecture.

State Board of Housing. This contribution to relief of Massachusetts' housing shortage was authorized by the State Legislature in 1946. (See page 266 for brief discussion of housing laws.) In Boston alone, the City Council has approved a $20,000,000 program, which will pay for well over 2000 new homes. These will be one-family and two-family houses, and also apartments. Construction is under way by the Boston Housing Authority on many separate sites in Mattapan, West Roxbury, Dorchester, Hyde Park, East Boston and other sections of the city.

A good many other cities and towns in the Metropolitan District have taken steps to construct houses under this same state program. Those with projects approved by the State Housing Board include Cambridge, Quincy, Somerville, Wellesley and Watertown.

New Construction on Vacant Land: The tendency of families to seek homes in the suburbs of our American metropolises has already been discussed. In the Boston area, most new construction for many years has been on vacant land; and most vacant land is found only on the outskirts of the city or beyond. During 1947, for example, permits for less than 1,500 new dwelling units were issued in Boston, as contrasted with some 6,500 actually built in the surrounding area of the Metropolitan District.

For the next several years, it seems inevitable that the great majority of new homes and apartment houses will be located in new unbuilt areas outside the city. Many of these have no streets and no utilities. This brings up the important problem of selecting areas that are most suitable for development. They must be neither swampy, nor too hilly. They must be convenient to main highways, railroads or transit lines and readily reached by water mains, sewers, and gas and electric service. Land that is better suited for orchards, farming or recreation should not be subdivided for home building.

That the best areas should be chosen for residential use is of the greatest importance to future home-owners and tenants. But they do not choose the areas. All they can do is to accept or reject a house that is offered for sale — or an apartment for rent. So long as the housing shortage continues, they will usually accept.

Boston Housing Authority

Play Space in a Public Housing Project

Areas Suitable for Residential Development — Boston Region.

Areas in black are those tracts of vacant land five acres or more in size that are zoned for residential use (exclusive of institutional and publicly owned land) and that are topographically suited for development, being neither too swampy, too steep, too rocky, nor in use as commercial market gardens or orchards.

The responsibility for selection of future home areas rests on the shoulders of the real estate developers who do the building; of the city and town planning boards who review the subdivision layouts; and of the banks and institutions that lend the money to finance construction. The part that the average citizen can play is to urge these three groups to select and approve only the best building sites.

Extent of Unsubdivided Land: Fortunately, Boston's metropolitan region has no shortage of good land from which to choose. The vacant land suitable for residential development (as shown on the accompanying map) could accommodate another 2,000,000 people in the Metropolitan District. This doubling of the present population would not require any changes in existing local zoning regulations governing the permitted number of families per acre.

It is most improbable that the Metropolitan District's population will ever double its present total. Hence, what is needed is not *more* land, but more careful study of how best to use *so much* land. It appears desirable that a great deal of the surplus land should be permanently protected from being subdivided for house lots. This could be achieved by zoning it for farming, market gardening and orchard uses. Some of the surplus could also be acquired for additional large regional parks.

Rebuilding Old Neighborhoods

It is generally believed that after a few years the emergency housing shortage will have been overcome by new construction, mostly on vacant land. Boston, Cambridge, Chelsea, Everett, Revere, Somerville and other municipalities must then turn their attention to the long-range housing problem. They must tear down their obsolete and substandard houses, and build modern types of residences in their place, with plenty of open land around the new structures. It is important that rebuilding be done, not house by house, but on a large scale, preferably embracing many city blocks in a single undertaking.

Private Redevelopment: This will require a great deal of cooperation between the private owners and builders on the one hand, and the state and city governments on the other. There are recent state laws in Massachusetts that offer certain helpful incentives.[1] Federal assistance to private real estate developers has also been proposed.

Some of the Boston areas that are ripe for wholesale rebuilding are illustrated in these pages. The task is not easy. It will take many years to accomplish. And it will require not only the will-to-do on the part of builders and government officials; but also the good will, determination and support of all good citizens. Let rebuilding be made a civic goal! Let the people of Boston, and of the other cities that have slums, take pride in hastening the day when the last block of tenements has been torn down. Let each of us do *our* part in building better neighborhoods for a happier future.

The Boston Housing Authority: There are many families of very low income living in inadequate housing who cannot afford to pay higher rent than they do now. How best to provide homes for these families is, therefore, a serious phase of the problem of replacing our dilapidated neighborhoods.

Boston Housing Authority

Old Harbor Village . . . . The Old Colony defense housing development is in background.

The Boston Housing Authority, in cooperation with the State Housing Board, has been putting one solution of this problem into successful practice for more than ten years. This is the construction of new low rent housing projects, supported by annual financial contributions from the federal government and further aided by exemption from local taxes, except for small service charges. By these means, rents are held down to a level that low income tenants can afford.

The first of these projects, Old Harbor Village in South Boston, was constructed by the Federal Public Works Administration.

Boston Housing Authority

Detail of Old Harbor Village

[1] See page 266.

It contains 1,016 dwelling units. Since early in 1938, it has been managed by the Boston Housing Authority. Six more low rent projects were built by the Housing Authority in the years immediately before the war. Three are in Roxbury; one in the South End; and one each in Charlestown and East Boston. These six provided 4,086 new family quarters, and involved tearing down an approximately equal number of substandard units. The excellent layouts of these large public developments, with their good design and ample open space, can be judged by examining the accompanying photographs. Note the contrast with the old buildings that surround them.

The Boston Housing Authority also constructed the Old Colony development in South Boston, a large "defense housing" project for workers in war industries. This was done in cooperation with the federal government, and though not a part of the low rent housing program, its 873 apartments may be used in the future for that purpose.

The low rent housing program is expected to be continued by building the Cathedral Housing project for about 500 families in

Proposed Public Housing Project for South Boston

Boston Housing Authority

Charlestown Housing Project . . . . Note contrast with crowded houses in foreground. *Boston Housing Authority*

the South End; and another project for nearly 1000 families in South Boston. Land for both these developments was acquired before the United States entered the war, but construction had to be deferred. All the old buildings have been cleared away from both sites.

A Look at the Future

In closing this discussion of our residential problems, it is well to sum up our ultimate objectives. First, the Boston region must solve the emergency of the present housing shortage. Steps to that end have been described. Progress, though slow at first, is now gathering speed.

Second, we must look forward earnestly to the time when every family in the region will have a good home — a time when there will be no more decayed housing areas. As much as possible of the rebuilding should be accomplished by private enterprise, with only such governmental assistance as is found necessary. Public housing authorities should provide quarters only for those families whose incomes are too small to pay rent for adequate privately financed homes.

Third, we hope to achieve a balance between construction in the environs for those who prefer to live outside Boston, and reconstruction in the city for those who wish the advantages of nearness to downtown Boston. With such balance between the suburban trend and the attracting force of the central city, the whole region will acquire a new stability and a new assurance of security in its future.

IV.

TRAFFIC AND TRANSIT PLANS

TRAFFIC

Need for Express Highways

Boston has become so accustomed to traffic congestion on its downtown streets and on the main highways leading to the city that many people are inclined to accept the situation as a necessary evil—an insoluble problem. Others say: "The only solution is to keep the cars out of Boston." Although conditions are admittedly bad, there is no need for despair. Present and future traffic problems *can be solved,* here as elsewhere. The business and industry of the region cannot afford to go on paying the costs of congestion; nor can the city close its gates against the streams of passenger cars and trucks upon which its prosperity depends.

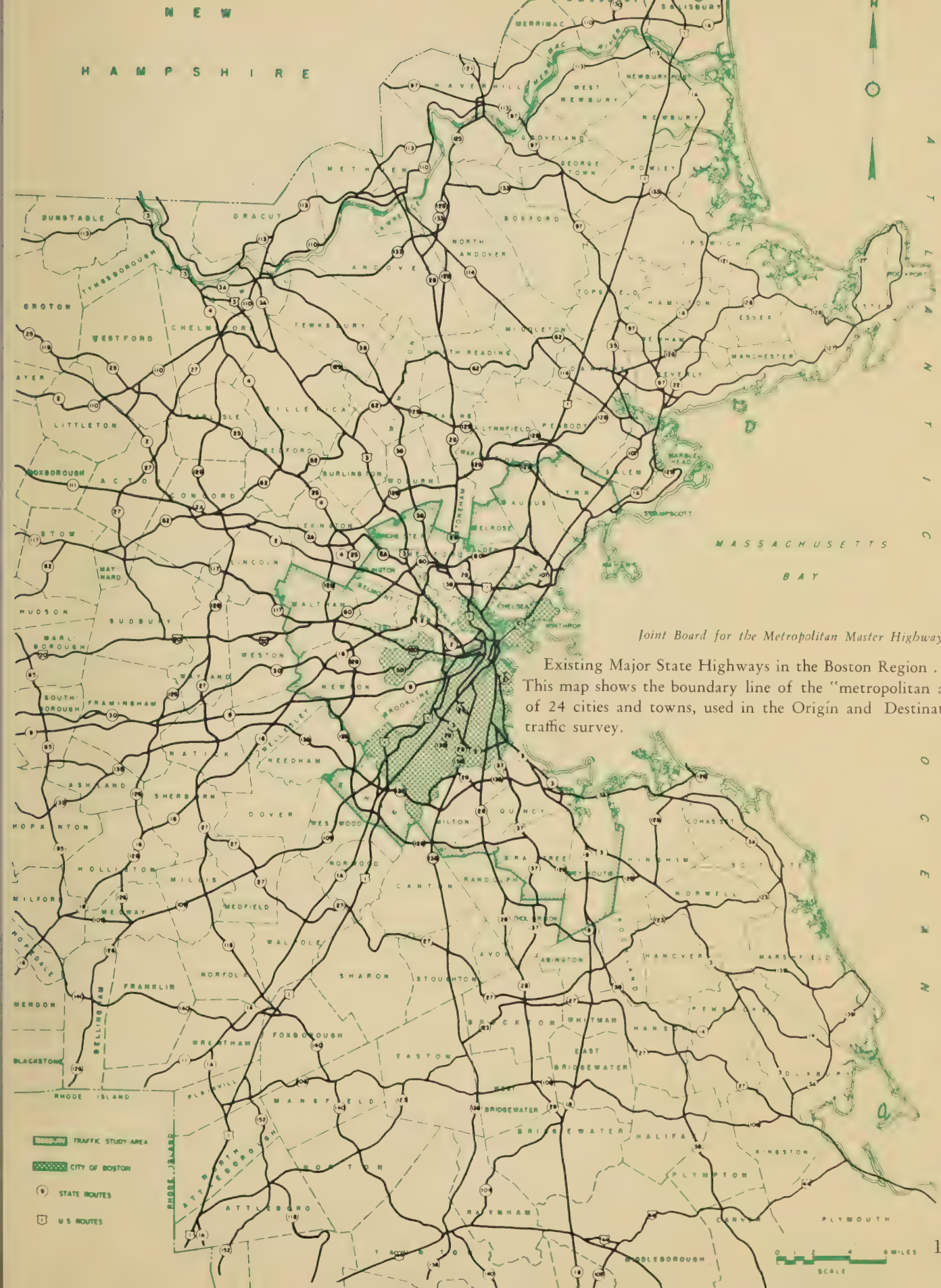
Furthermore, let us remember that we are planning not merely for the present but more especially for the future. Traffic engineers estimate that the number of motor vehicles in Massachusetts will increase 50 to 75 per cent during the first 20 years after World War II. The necessity for providing urban streets and highways to handle this great volume of traffic without congestion is the task that Boston and the Commonwealth are facing.

Much can be accomplished by local street improvements and better traffic regulations. These include roadway widenings to relieve traffic bottlenecks; more one-way streets; more traffic lights; elimination of curb parking; installation of traffic circles; and construction of grade separations by tunneling under congested intersections or bridging over them. All these are important, but they do not solve the major problem of assuring the uninterrupted flow of great volumes of traffic into and out of the city. There is only one answer. A modern city must have modern express highways. It cannot solve its present traffic problems nor hope to meet future requirements merely by making minor improvments.

Major Highway Problems

The Boston region has a network of good main highways leading away from the outskirts of the metropolitan area to all principal cities in Massachusetts, as well as to neighboring states. These are illustrated by the adjacent map. What the Boston region does *not* have is a system of express highways to connect its central area with these main state highways. Let us consider the region as a giant wheel with Boston as its "hub."

Traffic Congestion in Boston's Market District . . . . Off-street loading bays for trucks are the solution.



Joint Board for the Metropolitan Master Highway Plan

Existing Major State Highways in the Boston Region. This map shows the boundary line of the "metropolitan area" of 24 cities and towns, used in the Origin and Destination traffic survey.

Laurence Lowry

Highways from the Hub to the West

We have spokes for our wheel — the state highways — but the hub is not firmly connected to the spokes. Instead, we have narrow, tortuous, congested streets through which heavy streams of traffic must fight their way before they can reach the broad highways of the Commonwealth. In rush hours, it takes longer to drive a truck from Faneuil Hall to the Worcester Turnpike at the Brookline-Newton line — a distance of only seven miles — than to travel all the remaining 32 miles to Worcester!

The missing parts of the spokes of our highway wheel are the principal radials that should lead outward from the center, but which the regional highway system now lacks. Providing these necessary links will solve the worst bottlenecks of traffic congestion. In addition, our wheel needs a strong new hub — a circle highway close to the center, and a new rim to connect the spokes with each other at about 12 miles from downtown Boston.

Origin and Destination Survey of Traffic

In the autumn of 1945, a very thorough survey of the inner "metropolitan area"[1] was made, showing where the passenger cars and trucks came from and where they were going. The work was done by the Traffic Division of the Massachusetts Department of Public Works, in cooperation with the U. S. Public Roads Administration. Over 800,000 motor vehicle trips were analyzed, and more than 25,000 drivers were interviewed at their homes or places of work.

Only slightly over one per cent of the vehicles entering the Metropolitan Area desired to pass through without stopping. The volume of traffic travelling either into or out of the area was about 22 per cent of the total; and 77 per cent of all vehicles moved between points entirely within the area.

The great advantage of this Origin and Destination Survey is that it revealed where people started their trips and where they wanted to go. With this information, it becomes possible to plan a system of new highways that will actually meet the needs of the riding public. Guesswork is eliminated.

[1] For the purposes of this survey, the metropolitan area included Boston and 23 neighboring cities and towns.

Joint Board for the Metropolitan Highway Plan

In August 1947, the Governor of the Commonwealth directed the commissioner of the State Department of Public Works, the chairman of the State Planning Board, and the chairman of the Metropolitan District Commission to serve as a Joint Board to prepare a Master Highway Plan for Boston and the surrounding metropolitan area, using the Origin and Destination Survey as the foundation for their work. The Joint Board retained consulting engineers and submitted its plan as the basis for legislative action. This plan is such an important step forward that its principal proposals will be described in some detail. All the projects fit together as parts of an eventual framework of express highways, including a Belt Route encircling central Boston. Obviously they are not all of equal urgency. Moreover, as their combined cost is estimated at $322,000,000, it is evident that construction must proceed gradually as money can be made available. Assuming the assistance of federal funds to supplement state appropriations,[1] it would appear possible to complete this program in 10 to 15 years. The Joint Board has recommended a relative order of urgency for the different routes. It is the function of the Legislature to review the proposals and to determine methods of financing.

Radial Expressways Recommended by Joint Board

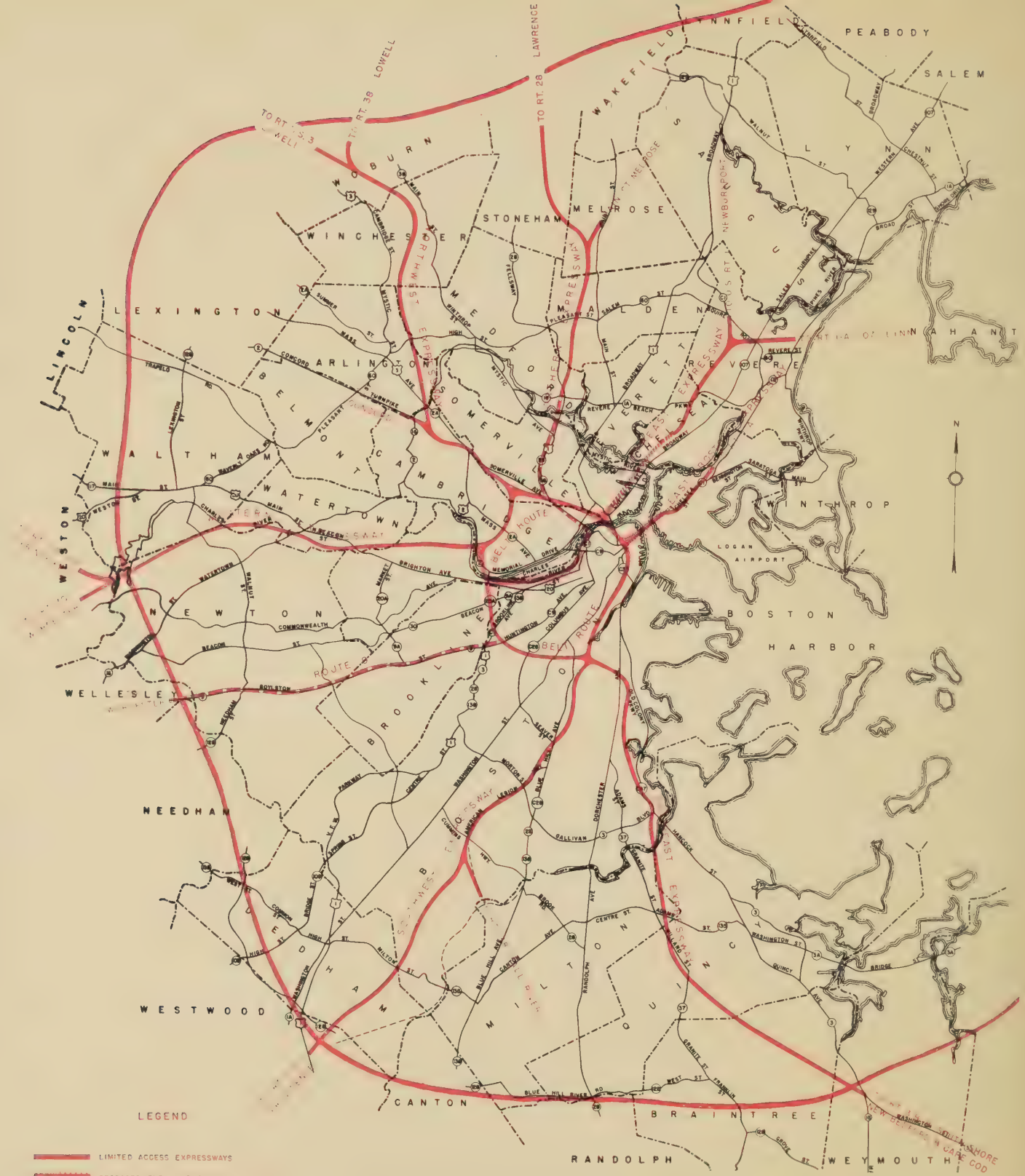
The location of each of the Joint Board's routes is shown on the map on page 196. There are seven new radial express highways and, in addition, substantial improvements are recommended for the Worcester Turnpike. All of these connect with a proposed Belt Route, which is to serve as a traffic distributor at the hub of the system. All routes are also connected together by a circumferential express highway (the rim), to be constructed by rebuilding existing State Highway 128. These express highways are to be the framework of the entire regional street and highway system. They have been planned to fit the traffic flow pattern revealed by the Origin and Destination Survey. They do not compete with adequate existing highways. Their locations have generally been chosen where land is inexpensive so as to avoid the high cost of buying valuable real estate. It is important to point out that all these expressways are intended for both passenger cars and trucks.

In the following paragraphs, the express highways are described in rotation, starting south of Boston at Quincy Bay and proceeding clockwise.

Southeast Expressway: A six-lane divided express highway, running from the Belt Route, in the vicinity of Massachusetts Avenue and Southampton Street, out through Dorchester, East Milton, West Quincy and Braintree to Weymouth, for a total distance of 11.9 miles. This artery, besides carrying heavy daily traffic between Boston and the Quincy Bay area, will also take care of the weekend traffic bound for South Shore resorts and Cape Cod.

Southwest Expressway: An expressway from the Belt Route, near Massachusetts Avenue and Southampton Street, through Dorchester, Roxbury and Hyde Park to join the main road to Providence (U. S. Route 1) in Dedham. The length is 9.8 miles, part of which will follow the existing

[1] The principal source of state highway funds is the gasoline tax.



The Joint Board's Metropolitan Master Highway Plan and the Outer Circumferential . . . . Eight radials, the inner Belt Route, and an extended Embankment Road. The outer circumferential highway (route 128) lies outside the area studied by the Joint Board. Its construction has been recommended by the State Department of Public Works. *Joint Board for the Metropolitan Master Highway Plan*

Joint Board for the Metropolitan Master Highway Plan
Perspective view of the Recommended Belt Route.

American Legion Highway. A connection with the Neponset River Parkway is also planned so as to provide an improved route to Fall River. A six-lane highway is required from Boston to the Neponset River, and four lanes will be adequate beyond that point.

Western Expressway: A six-lane express highway from the Belt Route in Cambridge at a point near the River Street Bridge, running roughly parallel to the Charles River and extending through Brighton, Watertown, and Waltham to connect with Commonwealth Avenue in Newton. Its location will be about two miles north of the Worcester Turnpike. Metropolitan Boston's heaviest traffic streams are to and from the west, and the recommended 7.6 miles of new express highway construction will relieve congestion on existing thoroughfares.

Northwest Expressway: An express highway from a point on the Belt Route near Union Square in Somerville, running parallel to the Fitchburg Division of the Boston and Maine Railroad to join the Concord Turnpike near Alewife Brook Parkway. From this point, the new route branches north through Arlington, Medford, Winchester and Woburn with connections to U. S. Route 3, Route 38 and circumferential Route 128. The total length to U. S. Route 3 is 9.6 miles, and additional construction in Woburn adds 1.9 miles. The Northwest Expressway would have six lanes between the Belt Route and the Concord Turnpike, and four lanes for the remainder of its length.

Northern Expressway: Extensive improvements to the existing Northern Artery, to provide a six-lane divided express highway from the Belt Route in Somerville, through Medford and Malden to Main Street in Melrose. From that point, a four-lane express highway would continue northward to meet Route 28 in Reading.

C. A. Maguire and Associates

East Boston Express Highway at Logan Airport . . . . To be constructed from Sumner Tunnel portal (right) to the airport, and northward to connect with McClellan Highway.

Northeast Expressway: A six-lane express highway extending from the Belt Route in the vicinity of City Square, Charlestown, across the Mystic River by means of the new toll bridge.[1] From the Chelsea end of the bridge, it would continue to a point in Revere, where it would branch into two four-lane expressways leading respectively to U. S. Route 1 (Newburyport Turnpike) and to routes 1A and 107.

Sumner Tunnel and East Boston Expressway: An express route from downtown Boston through the Sumner Tunnel and north through East Boston to meet Route 1A (McClellan Highway). A branch would provide an express connection to the Logan Airport. Detailed designs for these two highways have already been completed and actual construction was begun in 1948.

The Sumner Tunnel is now badly congested, but when the new Mystic River bridge is completed, it will divert considerable traffic from the tunnel. The Joint Board pointed out in its report that future traffic volumes will make it necessary to build a second vehicular tunnel to East Boston parallel to the Sumner Tunnel, so as to provide two additional traffic lanes. In the judgment of the Board, the new Mystic River Bridge and these twin tunnels will be sufficient to handle all anticipated future traffic between Boston and the northeast.

[1] See page 200

Fay Foto Service Inc.

Sumner Tunnel Portal, Boston . . . . Delays are due principally to the fact that inbound and outbound traffic streams have to cross each other's paths.

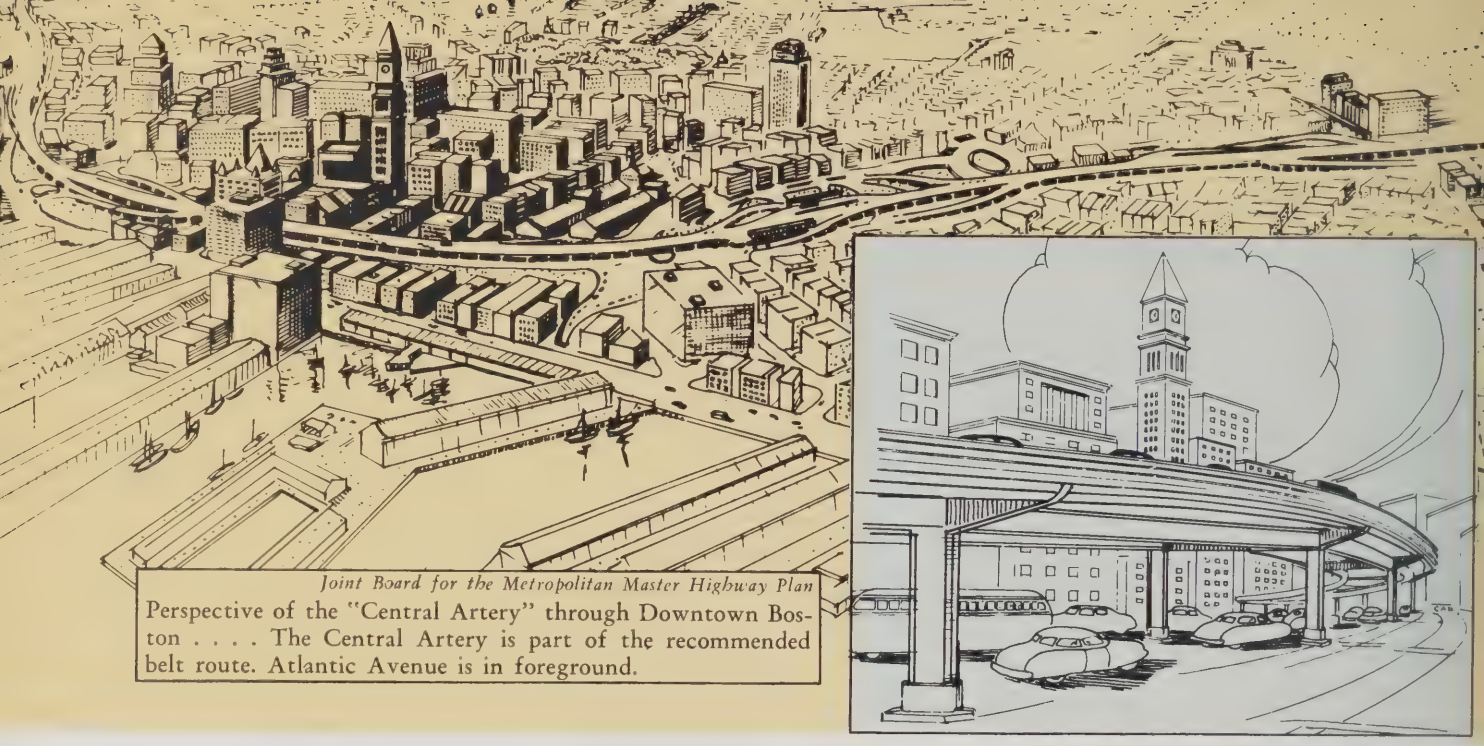
Boston Globe
Traffic Jam in Brighton

Fay Foto Service Inc.
Huntington Avenue Underpass at Massachusetts Avenue . . . . Note that illegal curb parking constricts moving traffic to one lane on each side of underpass. →

Belt Route

We have previously explained that all these express highways radiate outwards from the Joint Board's proposed central Belt Route, which will serve as the hub of the system. This Belt (see map, page 196) extends from near City Square in Charlestown to a point in Somerville near Union Square, thence through Cambridge and across the Charles River near Cottage Farm Bridge, and thence to Roxbury Crossing and easterly to the intersection of Southampton Street and Massachusetts Avenue. From there it continues parallel to the waterfront and Atlantic Avenue, cuts through the market district near the Sumner Tunnel, and proceeds across the Charles River to the point of beginning, in Charlestown. The easterly part of the Belt Route, in Boston proper, closely follows the "Central Artery" location recommended by the Whitten report in 1930. The entire length of the Belt is about 10 miles. It is recommended as a six-lane express highway. Its function is to distribute traffic to and from the main radial expressways and thus relieve congestion on the surface streets in the central area of the city.

Parts of the Belt Route would be on an elevated structure with frequent ramps to and from it. Beneath the elevated highway there would be a new surface thoroughfare. This would collect traffic from the intersecting streets and lead it to the ramps; and in the reverse direction, distribute traffic from the ramps to the local streets.



Joint Board for the Metropolitan Master Highway Plan
Perspective of the "Central Artery" through Downtown Boston . . . . The Central Artery is part of the recommended belt route. Atlantic Avenue is in foreground.

What the Central Artery would Look like

Embankment Road Extension

The Joint Board endorsed the proposal for the extension of Embankment Road from Hatch Memorial Shell along the Charles River Basin to Cottage Farm Bridge. The State Legislature, in 1946, authorized preparation of plans for this project. The Metropolitan District Commission has prepared plans for a modified or semi-express parkway, restricted for the use of passenger automobiles only. This extension will carry important streams of local and through traffic between downtown Boston and areas to the west that cannot be served properly by existing highways or by the proposed expressways.

Mystic River High Level Bridge

Traffic between Charlestown and Chelsea has been badly delayed for many years. The bridges over the north and south branches of the Mystic River are narrow and congested. Also, they are "low level" structures built close to the water and must therefore be swung open very frequently to permit ships, tugs and barges to pass. In a year of normal traffic, the main bridge, which spans the north channel, is opened more than 7000 times — about 20 times a day!

In 1946, the State Legislature passed a law creating the Mystic River Bridge Authority, with power to borrow money and build a new "high level" bridge, under which all shipping can easily pass. The bridge will therefore be a fixed span, instead of a movable structure. Plans have been prepared and construction was started in 1948. This great new bridge will be paid for entirely by tolls collected from the automobiles and trucks that drive over it. No state funds will be used. As has been pointed out, the new Mystic River Bridge is a link in the Northeast Expressway, leading to the Newburyport Turnpike.

Mystic River Bridge Authority

New Mystic River Bridge . . . . The channel width between the main piers will be 800 feet, with a vertical clearance of 135 feet. There will be one-way traffic on each deck of the bridge.

Outer Circumferential Highway — Route 128

Reference has been previously made to the need for building a new "rim" for the highway wheel of the Boston region. The State Public Works Department has recommended that this be accomplished by reconstructing existing Route 128 as an expressway. (The section from Beverly to Lynnfield has already been completed.) Route 128 runs from Gloucester in the northeast, through many towns and cities, including Lynnfield, Woburn, Lexington, Newton, Canton, Braintree and Hingham, to Hull in the southeast. It thus follows what is roughly the great arc of a circle of 12-mile radius, with its center at the State House. The entire length is 71.8 miles.

Automobile Parking

It is expected that many new parking garages will ultimately be built adjacent to the surface thoroughfare below the elevated expressway in downtown Boston. Some garages might have direct access from the elevated roadway (see illustration). The Joint Board for the Metropolitan Master Highway Plan pointed out in its report that the recommended expressways will serve their intended purpose only if they are supplemented by adequate garages in which to store automobiles as they arrive in the downtown area. The board also stressed that even a reasonably satisfactory solution of traffic congestion on surface streets will require almost complete prohibition of curb parking, together with strict enforcement.

It is well to remember that a roadway is primarily for movement of vehicles, secondarily for delivery of goods and people to abutting property, and only thirdly for storage of parked cars. When more lanes are needed for moving traffic, it becomes necessary either to eliminate parking or to widen the roadway. If the widening can be done simply by reducing unnecessary width of sidewalks, it may be worth while. But if it

Boston Traffic Commission

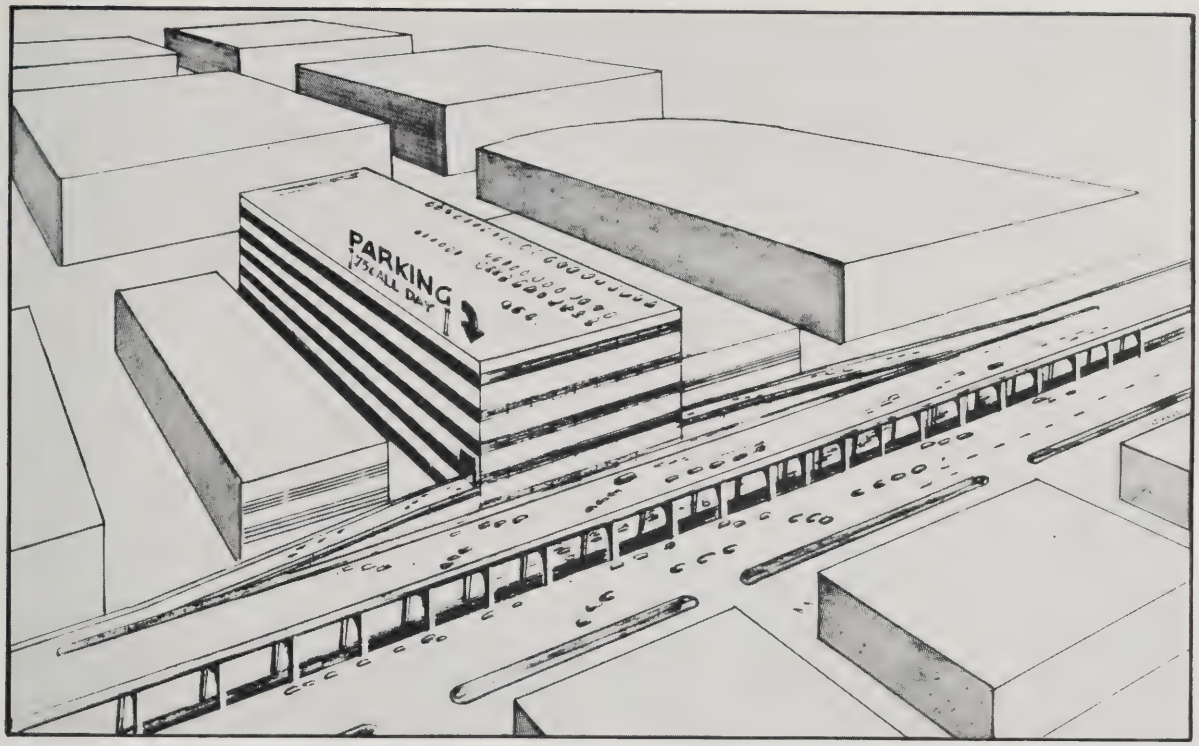
Street Blocked by a Heavy Truck

requires taking additional land and remodelling buildings, it becomes an extravagant method of providing parking space. In one eastern city, a street was widened for a length of only one block, thereby creating 30 additional curb parking spaces. The cost of these 30 spaces was more than $1,000,000!

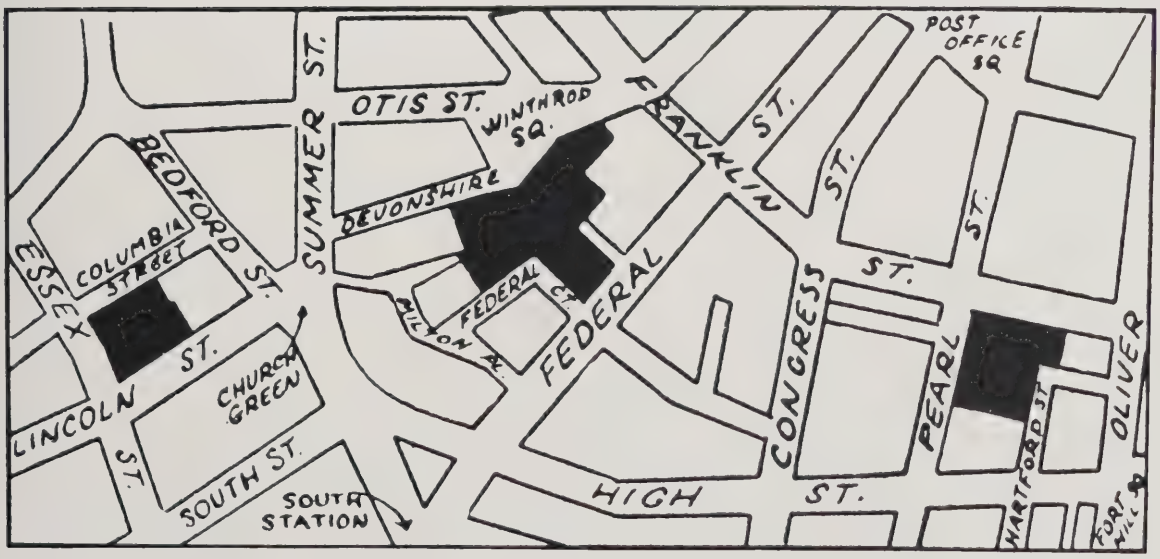
Public Off-Street Parking Facilities in Boston: The City of Boston is approaching its parking problem in a realistic way. With the authorization of the State Legislature, it has already borrowed $5,000,000 to acquire land for off-street parking and to construct garages. These parking lots and garages will be publicly owned but they will be operated by private firms on a lease basis. The first three sites were obtained by the city in 1947 (see adjacent map). They are well situated to serve the downtown district. If garages are built with four levels of parking, these three sites will accommodate about 2,000 cars. It is estimated that central Boston will ultimately need off-street parking spaces for 7,000 to 10,000 cars, in addition to those already existing in private ownership. More accurate determination of the city's need will require a detailed survey of the parking problem. Future parking locations must be well distributed so as to serve all principal downtown destinations, such as the retail stores, the financial district, the market district, and the leather and clothing district. A large number of locations is essential because motorists will usually not walk farther than 200–300 yards after parking their cars.

As new off-street parking facilities are opened up, it is anticipated that the city will enforce no-parking regulations on more and more of the narrower streets — particularly on those that are near these facilities. This is recognized as the best policy to pursue. If, on the other hand, curb parking were to be prohibited *before* the new off-street spaces become available, it would work a hardship on the driving public and on downtown business enterprises.

Post Office Square . . . . Parking on the street and off it.



A Parking Garage . . . . Designed for a location close to the Central Artery.



Boston Public Off-Street Parking Locations . . . . Acquired in 1947 by the City of Boston. Garages may be built on some or all of these sites.

Proposed Garage under Boston Common: In 1946, the State Legislature authorized the City of Boston to lease part of the land under Boston Common to private interests, who would finance and construct a large underground garage with entrances and exits along Charles Street. The State Supreme Court handed down a ruling in May of 1948 that the Common can be used for this purpose. Construction of the Boston Common Garage would help to solve the parking problem for the Park Square business district and other nearby areas.

Parking Spaces at Outlying Rapid Transit Stations: One very desirable way to reduce street congestion in downtown Boston would be to persuade people who do not actually need their cars in town to use the subway and street car lines. This can best be accomplished by having large well-maintained parking lots at outlying stations of the transit lines, with very reasonable fees for all-day parking. A business man or shopper can then drive from his home to the nearest transit line, leave his car, and make the rest of his journey for a 10 cent fare, which is less than the cost of driving all the way downtown. Transit terminal parking lots have been established in metropolitan Boston, but only to a limited extent. More are needed.

Parking Meters: Many municipalities in the Boston region have followed the national trend by installing parking meters in order to enforce reasonable time limits for cars standing at the curb. A usual procedure, which has been found to work well, is to let the motorist put a penny in the slot of the meter to pay for the privilege of parking 12 minutes; two cents for 24 minutes and so forth up to a maximum of 10 cents for two hours. In some busy locations, of course, two hours is too long a time to permit a single car to hold a space at the curb. A limit of one hour, or even 30 minutes, may be the best answer. It is important to recognize that curb parking will always be very much in demand. At the same time, it should be considered to be a privilege. As such, it is entirely proper to charge a few pennies to insure that the privilege will not be abused. Time limits should be adjusted so that the shopper or businessman may be reasonably sure of finding a convenient place to park his car for a short time. If he wishes to park for a half day or longer, it is only fair that he pay for off-street parking space. In the Boston region, parking meters are already a familiar sight in Cambridge, Somerville, Waltham and Framingham. Boston has made experimental installations in various sections of the city, before deciding whether to buy meters for the main downtown business streets.

TRANSIT

A brief historical sketch of the development of Greater Boston's excellent transit system is given in Chapter I of Part II.[1] From very early times, rapid transit and highway traffic have been closely related problems. The Tremont Street Subway — first in the United States — was built to relieve street traffic congestion. Such congestion is still one of Boston's most critical problems. An important contribution to its solution would be to improve and extend Boston's rapid transit service, so that more people will commute on street cars, subways, and buses, and fewer in private automobiles.

[1] See page 163

Before — The Streetcars on Boylston Street Went Underground — After — *Metropolitan Transit Authority*

Metropolitan Transit Authority

In 1947, the State Legislature established a new political subdivision of the Commonwealth — a regional agency of government — the Metropolitan Transit Authority (M.T.A.). The Authority now operates all the transportation service previously furnished by the Boston Elevated Railway

Before — Boylston Street — After — *Metropolitan Transit Authority*

Company. There are a few privately owned bus lines, such as those of the Eastern Massachusetts Street Railway Company, which operate within the M.T.A. district but not under its jurisdiction.

The M.T.A. has achieved complete public ownership of the former Boston Elevated Railway Company by the purchase of all its assets and property.[1] This purchase has also eliminated the outstanding common stock of the company.

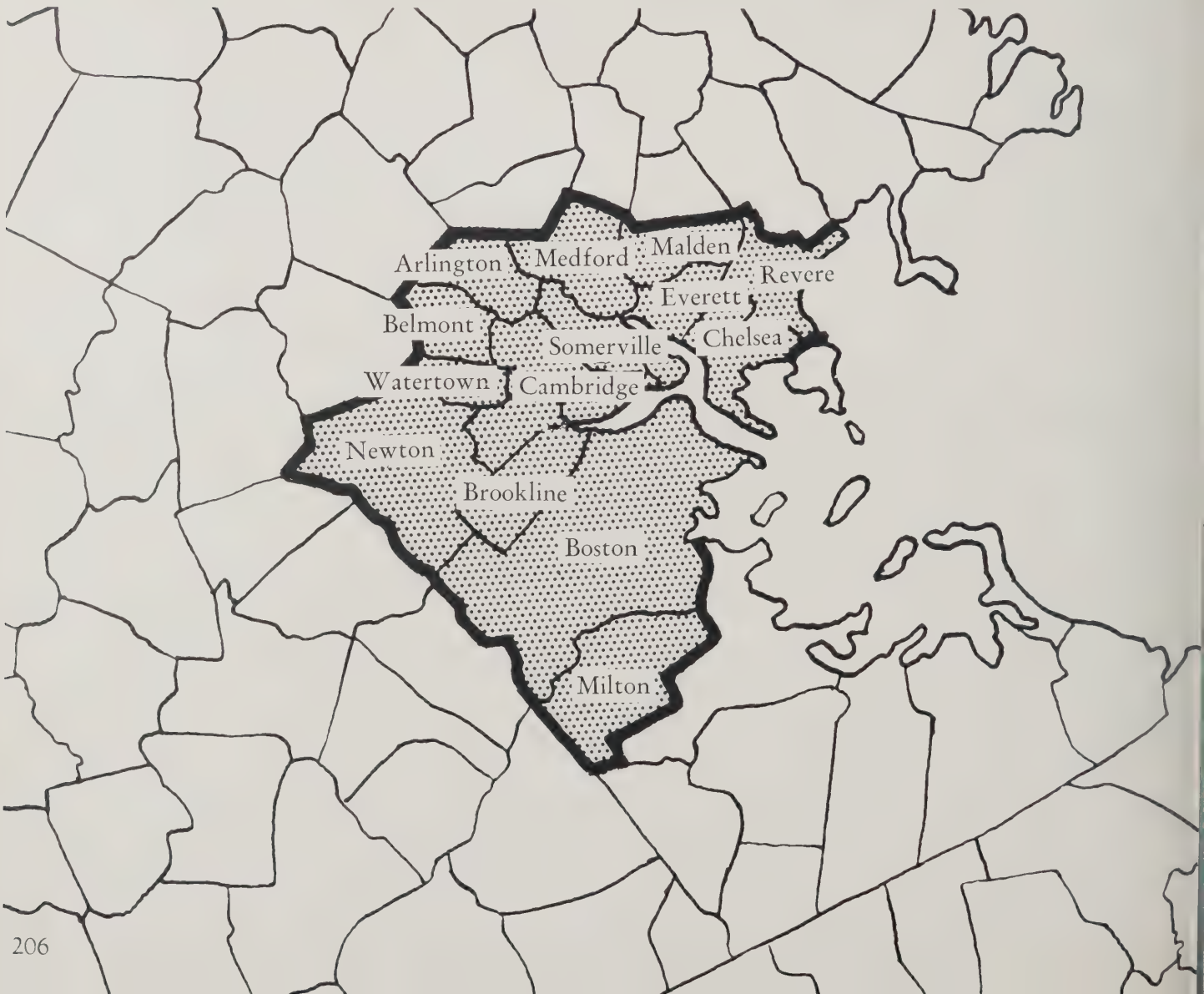
The 14 municipalities now served by M.T.A. are:

Arlington	Malden
Belmont	Medford
Boston	Milton
Brookline	Newton
Cambridge	Revere
Chelsea	Somerville
Everett	Watertown

These towns are shaded on the accompanying map.

[1] Public ownership eliminates the payment of dividends to private investors, and also the payment of federal income taxes.

Metropolitan Transit Authority Area of Service.



The M.T.A. system embraces 21 miles of subways and elevated structures, 350 miles of surface street car tracks, and 168 miles of bus routes. In 1946, the system carried 433 million passengers. There were 1,514,000 passengers on a single peak day, which is about equal to the population of the 14 cities and towns in the M.T.A. district. Many people living outside the district also use the system, which is estimated to serve a total population of about 2,000,000.

Under the terms of the state law,[1] the M.T.A. is given power to plan extensions of transit lines beyond its present district, but construction costs must be authorized by the Legislature. A local referendum of the voters is also required in regard to such an extension (subway, street car or bus). When a new line or extension is to be operated within the present district, approval by the Department of Public Utilities is substituted for authorization by the Legislature.

As one of its first improvements, the M.T.A. proposes to replace the street car lines in the Dorchester-Roxbury area by trackless trolleys, as soon as equipment is available and necessary station changes can be made.

Plan of the Rapid Transit Commission

Creation of the M.T.A. was advocated by a special Legislative Commission on Rapid Transit. In detailed reports issued in 1945 and 1947, this commission recommended a comprehensive series of extensions of existing transit lines. The 1947 report proposes service to 12 cities and towns in addition to those now within the M.T.A. system. The Legislature has instructed the M.T.A. to consider these recommendations. Because they are so important, and actually constitute a complete Master Plan for Transit, they are listed here in detail, and illustrated on the map printed on page 209. They are:

1. From an extension of the Cambridge-Dorchester Subway near Savin Hill, over the Old Colony tracks of the New York, New Haven and Hartford Railroad, through Atlantic, Norfolk Downs, Wollaston and Quincy to Braintree. Feeder bus service from the Braintree terminal could be provided to Scituate, Whitman and Brockton.

2. From Forest Hills, over the main line New Haven tracks, through Hyde Park to Readville.

3. From Forest Hills, over the tracks of the West Roxbury branch of the New Haven, through Roslindale, West Roxbury, and Dedham to East Dedham. Extension of this line to Readville would provide a loop transit system from Forest Hills (see map).

4. From the Beacon Street Subway near Park Drive, over the Boston and Albany tracks, through Brookline, Chestnut Hill, Newton, Newton Highlands and Waban to Riverside. A branch extension from Cook Junction near Newton Highlands would travel over the New Haven tracks through Newton Upper Falls and Needham to Birds Hill, Needham.

5. From the Tremont Street Subway near Castle Square, over the Boston and Albany tracks, through Allston, Brighton and Newton to Riverside.

6. Extension of the Cambridge-Dorchester Subway from Harvard Square to a point near Porter Square, then over the tracks of the Fitchburg Division of the Boston and Maine Railroad to a terminal in West Cambridge between Alewife Brook Parkway and Concord Turnpike. This terminal also

[1] Chapter 544, Acts of 1947.

would be located on another new transit line extending over the Boston and Maine tracks from Waltham Highlands through Belmont to West Cambridge, and continuing through Arlington to Lexington (see map).

7. From the Lechmere viaduct, Cambridge, over the tracks of the New Hampshire Division of the Boston and Maine, through Somerville, West Medford, and Winchester to North Woburn.

8. From Sullivan Square, Charlestown, over the tracks of the Western Division of the Boston and Maine, through Malden, Melrose and Wakefield to Reading. A western extension, over the tracks of the Medford Branch of the Boston and Maine, would reach to Medford Square. Feeder buses would connect this transit line with Stoneham and parts of Winchester.

9. From Boston's rapid transit extension at Orient Heights, over the Narrow Gauge right-of-way, through Revere and West Lynn to Lynn.

General Discussion of the Transit Plan

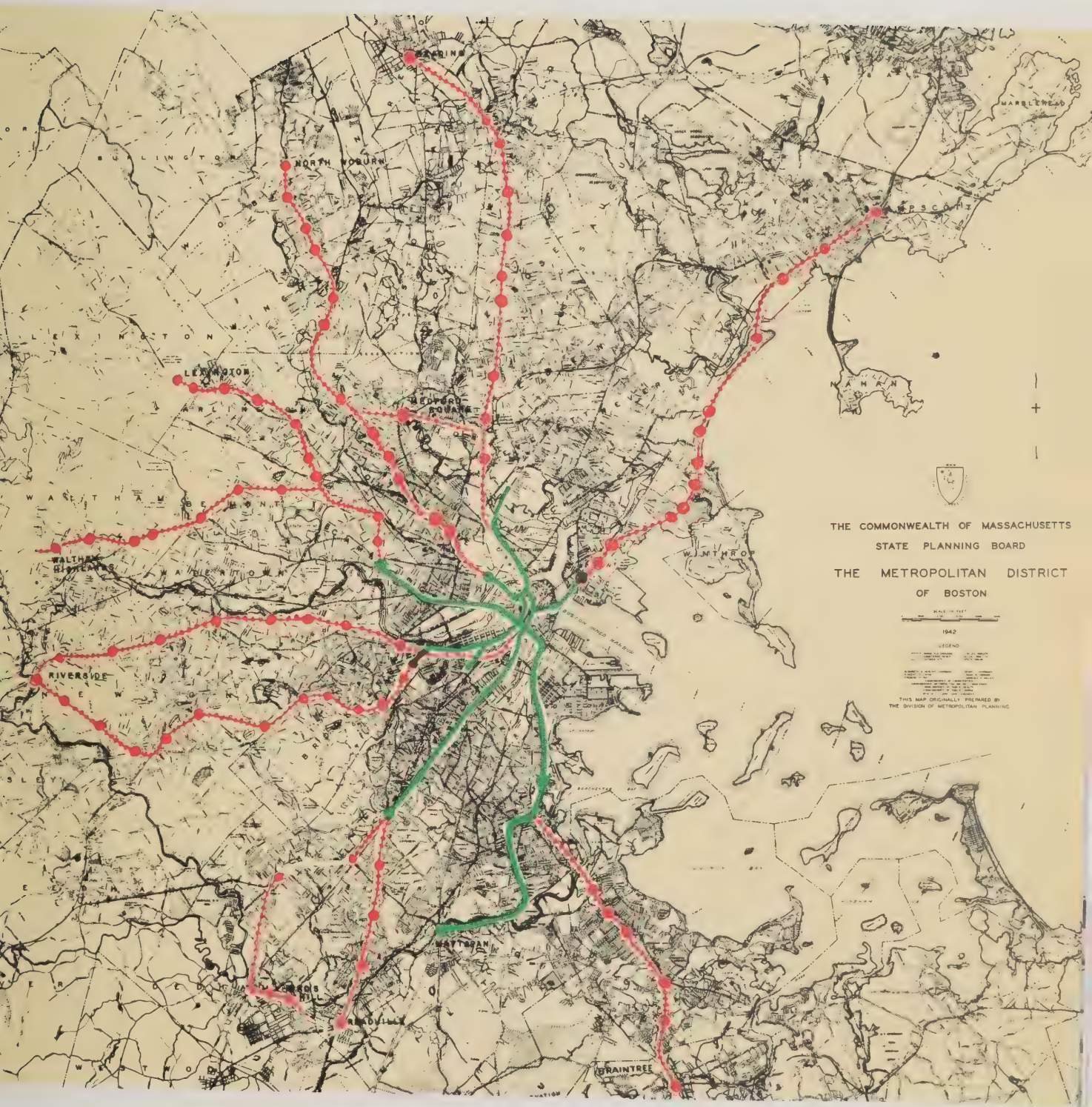
Most of the proposed route extensions would utilize suburban tracks of existing steam railroads, and connect them with the electrified lines of the M.T.A. system. The railroads have been operating a number of their commuting lines at a financial loss. Some are slated to be abandoned. It is therefore logical for the M.T.A. to take over such railroad trackage and provide continuous service with high speed street cars or rapid transit trains. Building the necessary physical connections between the M.T.A. and the railroads does not present any very difficult engineering problems. The proposed extensions would tie in with the four existing tunnel routes: the Tremont Street Subway; the Washington Street Subway; the Dorchester-Cambridge Subway; and the East Boston Tunnel.

Detailed plans are now being carried out for extending the East Boston line from Maverick Square to Orient Heights. Authorization of construction was given by the Legislature in 1946. The plan provides for a possible future connection directly to the Logan Airport Administration Building.

Before *Metropolitan Transit Authority*

Removal of Atlantic Avenue El . . . . South Station and Dewey Square.

After



Based on Map in Report of Recess Commission on Rapid Transit

Plan for Extensions of Rapid Transit Routes . . . . Rapid transit now reaches about five miles from Park Street. These proposals would extend service another 10 miles.

1948 *Metropolitan Transit Authority* Soon

Washington Street at Cathedral of the Holy Cross

Most Urgent Transit Projects

When the Legislature created the M.T.A., it specified that the following projects should be given first attention:

(a) Enlargement and improvement of the Scollay Square, Park Street and Boylston Street stations, and the construction of two additional tracks between Scollay Square and Park Street stations. At present, there are four tracks between North Station and Scollay Square; and four tracks from Park Street to Boylston Street. As the section between Scollay Square and Park Street has only two tracks, it is now the most serious bottleneck in central Boston. The above improvements were authorized by the 1948 Legislature, at an estimated cost of $11,500,000.

(b) The removal of elevated structures and the construction of subways in their place. The 1948 Legislature authorized $19,000,000 for extension of the Washington Street Tunnel to a point near Cedar Street, Roxbury and for tearing down a long section of the Washington Street El.

(c) Extension of rapid transit service as far as Braintree (see map) by the use of the lines of the Old Colony Railroad, which is one of the steam railroad commuting lines that has been losing money. Notice of suspension of its service has been given. Various alternate plans to meet this situation are being considered.

(d) Extension of the Cambridge Subway to a point near Porter Square. This proposal is described in more detail in the previous section "Plan of the Rapid Transit Commission" (Item 6).

Use of Expressways for Express Bus and Street Car Service

The Joint Board for the Metropolitan

Highway Plan and the Metropolitan Transit Authority are interested in opportunities for combining new expressway construction with new transit service. In its simplest form, this combination involves operating express buses on the express highways. Sometimes, it is desirable to design the new express highway so that it will have a central strip for street railway tracks. A simple example of this is shown in the adjoining photograph. The best local instance of unified design is the combined layout of the East Boston Express Highway and the Maverick-Orient Heights rapid transit extension. Both projects were placed under construction in 1948.

Further possible combinations are now being studied in the Boston region. However, there are some factors here that make combined service less practical than in other urban regions which are not so densely built-up. Most of Greater Boston's needed transit line extensions can be routed over existing railroad tracks, while most of the new expressways cannot. Also, the transit lines must generally pass through heavily populated areas in order to give the best service to the maximum number of people. Expressways, on the other hand, should take advantage of vacant undeveloped locations where land can be purchased more cheaply. For these reasons, the combination of expressways and local transit in and near Boston will not be practical in a great many cases. Needless to say, long distance bus service to Providence, New York and other principal cities should be routed over the future express highways, as no local pick-up and discharge of passengers is involved.

An Express Highway Combined with Rapid Transit

V.

RAILROAD, PORT AND AVIATION IMPROVEMENTS

RAILROADS

The Boston region is a great manufacturing center. There are no coal or iron mines in New England, nor do its farms produce more than a small fraction of the food we eat. We are therefore very dependent upon *transportation* to bring in coal, iron and other raw materials for industry, and food for our population; and to send out our manufactured products to other sections of the country. The largest share of this transportation service is rendered by the New England railroads.

The Three Major Railroads

Greater Boston is served by three major railroads as shown on the accompanying map. Each of these has many branches. The main line of the New York, New Haven and Hartford runs between Boston and New York. The system serves rich industrial sections in Massachusetts, Rhode Island and Connecticut.

The territory of the Boston and Maine Railroad comprises the northern and northeastern parts of Massachusetts and all of New Hampshire and Maine. It extends westward to Troy, New York, six miles north of Albany.

The Boston and Albany Railroad serves the area west of Boston between the New Haven and the Boston and Maine territory. It is now under lease to the New York Central Railroad, with which it connects at its western terminus in Albany.

None of these three major railroads extends west of Albany nor beyond New York City. There is no main "trunk line" from Boston to the Middle West. This places Boston at a decided disadvantage, as all freight shipments to and from such railroad centers as St. Louis, Chicago and Cleveland must be carried part of their way by railroads that do not operate in New England.

Diesel-Electric Freight Locomotive . . . . This type is a triple unit of 4500 horsepower.

New Haven Railroad

Modern Railroad Coach with Novel Observation Deck . . . . This type of car cannot be used between Boston and New York as it is too high to pass through the Park Avenue tunnel leading to Grand Central Station.

The Three Major Railroads, Industrial Districts and Airports.

Laurence Lowry

Rear View of North Station and the Charles River.

Laurence Lowry

Boston's North Station . . . . The Warren and Charlestown bridges over the Charles River show in background.

Railroad Passenger Stations

The New York, New Haven and Hartford, and the Boston and Albany share the use of Boston's South Station, which was completed in 1899. More than 80,000 passengers a day pass through this station.

The Boston and Maine Railroad operates from the North Station on Causeway Street. This was opened in 1928 and is one of America's most modern terminals. Both stations are illustrated in these pages.

The Boston Elevated Railway used to have a direct line over Atlantic Avenue and Commercial Street, connecting South Station with North Station. In 1938, this structure was torn down, resulting in a very desirable street improvement. Since that time, however, passengers desiring to transfer between South and North Stations must either take a taxi, use a bus line, or go by subway to Summer Street and there change trains. Proposals have been made

Air View of South Station, Fort Point Channel and Business Center.

Boston's South Station . . . . Terminus of the New York, New Haven & Hartford and the Boston & Albany railroads.

The New Haven Railroad

for a direct railroad tunnel connection between these stations, so that some of the through and commuting trains of all three railroads could serve both stations. With this tunnel, for example, it would be possible to operate through trains between New York and Portland, Maine, with stops at South and North Stations in Boston. Physical difficulties and the great cost involved have prevented such a project from being carried out. It remains a matter for future consideration. If feasible, it would be very advantageous to the city. It would serve as a substitute for a single union terminal station for all railroads, which would be very much more difficult to provide.

Railroad Passenger Commuting Service

With the increased ownership of automobiles, a great many people now travel to the city by highway instead of by train. Rail commutation has therefore fallen off, despite continuing population growth of the surrounding cities and towns that serve in part as "dormitories" for Boston's workers. Loss of passengers means loss of railroad revenue. On many lines, the railroads run fewer trains than they used to; and some of the rail branches have been abandoned. The question of providing substitute service to replace steam railroad commuting lines is discussed in the previous chapter.

Boston and Maine Railroad Yards in Charlestown . . . . Charles River Dam is at right of center.

Laurence Lowry

Laurence Lowry

The Back Bay . . . . Note railroad passenger yards at right of center. Commonwealth Avenue is the wide boulevard running up the middle of the photograph.

Commuting service on all principal railway lines is good; and on the minor lines, as many trains are operated as the traffic appears to justify. Running time to Boston from stations 15 miles away varies between 30 and 40 minutes, depending on the route and the number of stops.

Rail Freight Connections

The movement of rail freight obviously requires connections between the separate railroads, so that cars can be shifted from one line to another as an essential service to industrial plants. Some large cities, like Chicago, have a complete belt-line railroad, operated by a separate company and interconnecting all the principal rail routes into the city. Boston does not have a true belt-line. Interchange is effected instead over the branches of the three railroads.

The New Haven and the Boston and Albany connect at South Station, but freight cars have to be shifted across the New Haven's passenger tracks. This operation is generally performed at night. The yards in the Back Bay (see photograph) are used jointly by both railroads, but only for passenger cars.

The Grand Junction branch of the Boston and Albany runs from the Allston yards across the Charles River close to Cottage Farm bridge. It proceeds through Cambridge and the East Somerville yards of the Boston and Maine, where interchange of freight cars takes place (see map). The Grand Junction branch continues through Everett and Chelsea to the Boston and Albany's docks on the East Boston waterfront.

The New Haven has a freight route, known as the Union Freight Railroad, from South Station along the surface of Atlantic Avenue and Commercial Street to North Station, where it connects with the Boston and Maine. Because of the heavy automobile and truck traffic on these streets, its operation is not particularly satisfactory, and freight cars must be moved principally at night.

THE PORT OF BOSTON

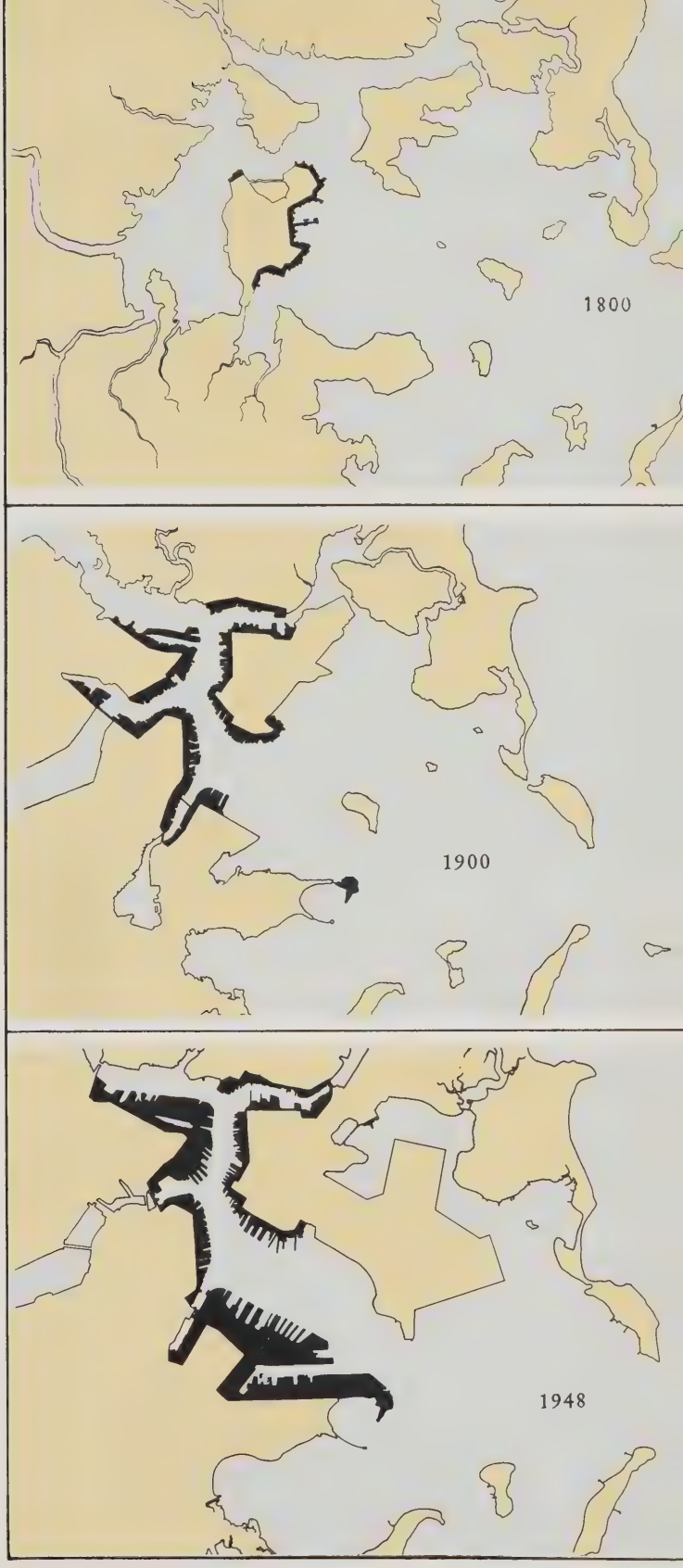
It is well to point out again that much of Boston's early growth to commercial greatness was due to its fine port. The waters of the main harbor are deep enough for the largest ocean-going ships. Boston is the nearest American port to Europe, and is also closer to Rio de Janeiro and Buenos Aires than any other port on the eastern seaboard.

New York, of course, is by far the greatest port in the United States. In terms of combined import and export cargo tonnage, the Port of Boston ranks about ninth; but on the basis of imports alone, it holds fourth or fifth place. However, its relative rank in the nation does not lessen its fundamental importance to Boston and New England. Its annual tonnage is increasing, and energetic steps are being taken to improve docks and shipside facilities. The prosperity of the Boston region continues to depend a great deal upon the port.

The Five Waterfronts of the Port

Geographically, the Port of Boston is divided into five parts separated from each other by waterways (see air photograph and the three sketch maps showing the growth of the port from 1800 to the present):

Boston Proper: This is the old waterfront along Atlantic Avenue and Commercial Street. It is now used mostly for coastwise and local harbor traffic. India Wharf, Central Wharf, Long Wharf, T Wharf, and other old piers are here. Rail service is provided by the Union Freight Railroad.



Growth of Boston's Port Areas

Fay Foto Service, Inc.

The Port of Boston

Charlestown: The Old Hoosac and Mystic Docks are in this area, and also the United States Navy Yard. Charlestown is served by the Boston and Maine Railroad.

Chelsea: The docks on Chelsea Creek are devoted principally to tanker traffic. It is in this section that gasoline and oil are stored in large quantities.

East Boston: Here are the four piers of the Boston and Albany Railroad, two of which are modern. The Bethlehem Steel Company's ship construction and repair yards are also on this waterfront.

South Boston: Boston's most modern harbor installations are in this area. All are served by the New Haven Railroad. Commonwealth Pier Number 5 was built by the State in 1914 and is recognized as one of the finest piers on the Atlantic seaboard. It is a two-story structure, 1,200 feet long by 400 feet wide. There is ample berthing space for five ships. It was at Commonwealth Pier that many thousands of our soldiers boarded the Queen Mary during World War II.

Fish Pier is 1,200 feet long by 300 feet wide and is the only pier of its size in the United States devoted exclusively to receiving, processing and storing fish.

The United States Navy Yard Annex has piers and a drydock, which are used exclusively for naval vessels.

Laurence Lowry

South Boston Waterfront

Boston and Albany Piers . . . . U.S.S. New Mexico is at Pier Number One (extreme left). This and the next pier (Number Two) are to be rebuilt. The two right-hand piers are modern. *Laurence Lowry*

Castle Island and the Army Base . . . . South Boston's newest terminals. Castle Island is in foreground; and the Army Base to the right and above.

Laurence Lowry

The Army Base is one of the biggest piers in the country, with berthing space for six ships. It has two large concrete cargo sheds. These facilities were leased in 1947 to a private corporation. The United States Army retains the use of an eight-story concrete warehouse.

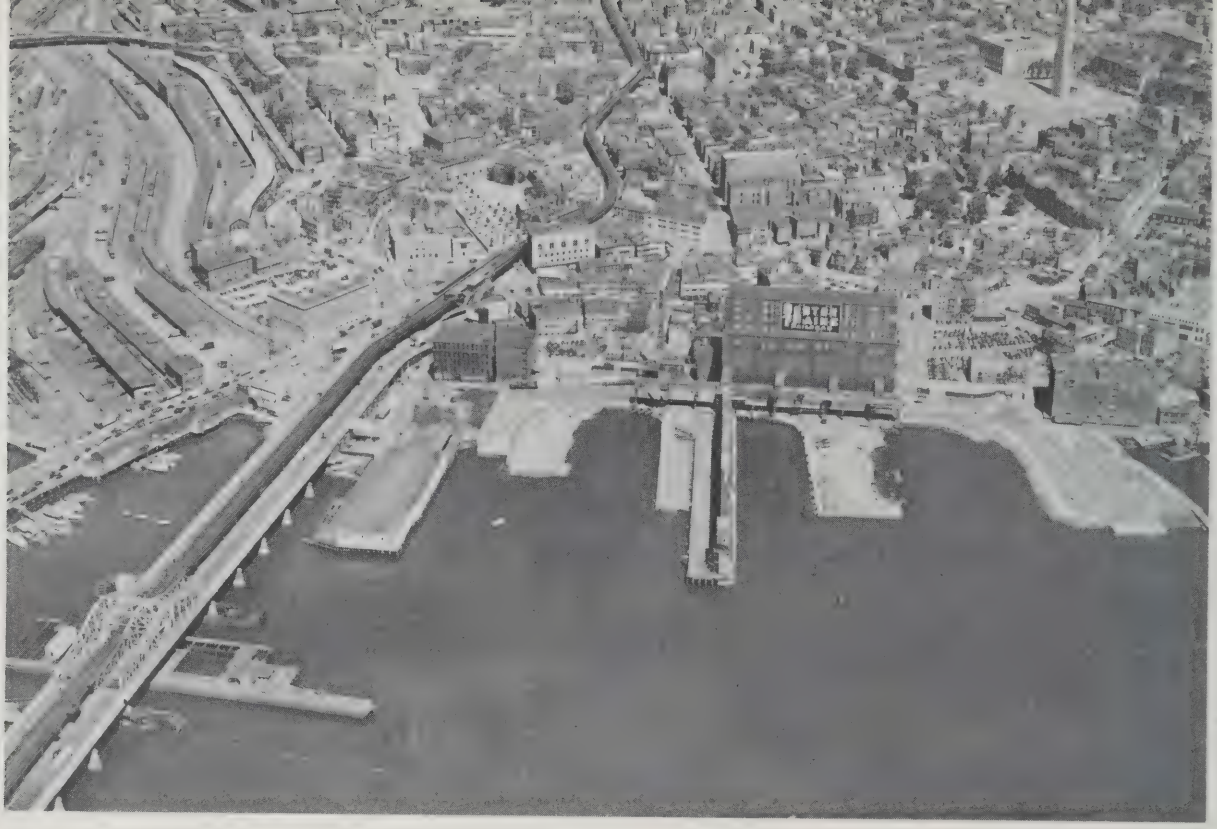
Castle Island, across the Reserve Channel from the Army Base, comprises approximately 100 acres of land, of which 80 are owned by the Commonwealth and about 20 by the federal government. Seven ships can be berthed simultaneously. There are two cargo sheds, one of which is a temporary wooden structure.

The Port of Boston Authority

Many of Boston's piers and harbor facilities are obsolete and worn out. They are not good enough to compete with efficient installations at other Atlantic ports. They are "behind the times."

Recognizing the necessity for post-war modernization, the State Legislature created in 1945 a new Port of Boston Authority, and appropriated state funds for waterfront construction. Subject to the approval of the Governor and Executive Council, the Authority can purchase piers, and rebuild and lease them to railroads and other private corporations. This is an example of public ownership combined with private operation. The Port of Boston Authority also manages some state-owned piers, including Commonwealth Number 5. (Fish Pier is state-owned but privately managed.)

It is the Authority's duty to regulate the commerce of the port. It solicits new business and in this way not only increases



Laurence Lowry

Site of New Hoosac Terminal, Charlestown . . . . Charlestown Bridge at left. Bunker Hill Monument in right background.

shipping tonnage, but adds materially to the prosperity of the whole Boston region. The Port Authority has branch offices in New York, Washington, D.C. and Chicago to promote the advantages of shipping via Boston. Besides more cargo and better piers, there is need for more frequent arrivals of ships and departures for all principal ports of the world. The goal for the Port of Boston can be summed up in a few words: more cargo, more piers, more ships; these spell more prosperity.

Program of Port Construction

The Port of Boston Authority has prepared a long-range plan and program for additional modern piers and handling facilities. Actual construction has begun. The principal projects are described below. They are listed in their relative order of urgency.

1. Hoosac Terminal: A new pier on the site of the old Hoosac Docks in Charlestown. It will be approximately 540 feet long by 500 feet wide, with berthing space for three ships. Railroad tracks will be built at shipside and within a new one-story cargo shed. By modernizing the grain handling equipment, the time required to load a ship will be reduced from eight to less than two days. It is anticipated that more export grain cargo could then be attracted to Boston from the Middle West. Construction cost for the entire project is estimated at $4,225,000. The land was purchased from the Boston and Maine Railroad and the new terminal has been leased back to that company for operation. The terminal is expected to be completed by the summer of 1949.

Laurence Lowry

Mystic Terminal, Charlestown . . . . This dock is to be rebuilt. The old Mystic River bridges are in background.

2. Mystic Terminal: This project will provide a large modern pier for three ships on a site now owned by the Boston and Maine Railroad. It is located alongside the Mystic River Bridge. Construction is not expected to start until the Hoosac Terminal has been completed. Funds are available for both land acquisition and construction.

3. Boston and Albany Terminal: Preliminary plans call for tearing down the dilapidated Boston and Albany Pier Number 2. A new pier will be built in combination with the reconstruction of the adjacent Pier Number 1, so as to form one modern pier. Consideration is also being given to modernizing the present grain elevator and grain handling equipment. As the Boston and Albany's Piers 3 and 4 are modern, this project would give that railroad three up-to-date piers.

4. Castle Island Terminal: If the Port Authority is able to acquire this property from the federal government, it proposes to construct an efficient commercial terminal. Castle Island was specially designed and built for military purposes. Preliminary plans call for remodeling one of the cargo sheds and entirely rebuilding the other. A large portion of the terminal area could be set aside for the construction of industrial plants. This property has great possibilities and could become one of the most modern port and industrial layouts on the Atlantic Coast.

The Old Boston Waterfront

Replacement of the ancient docks along Atlantic Avenue and Commercial Street is not included in the Port Authority's present program. It is considered better to build our new general cargo piers where rail facilities are already excellent, and where access by trucks is not seriously hampered by street traffic congestion. Large new industrial buildings may ultimately replace Boston's

old wharves. One wharf is being used as the site for a modern cold storage plant. Two others were purchased in 1947 by a sugar refining company. Specialized industrial uses, rather than general cargo handling, may prove to be the best future for the dock area that once made Boston famous.

The Port of Boston and Its Competitors

Boston's principal competition is with the great Port of New York, which handles nearly six times our tonnage of water-borne freight. Much cargo that could equally well be routed through Boston goes by way of New York as a matter of established custom and habit. By improving our facilities, it should be possible to increase Boston's import and export traffic very materially.

The charges for hauling rail freight from the Middle West to Boston are the same as to New York. Freight rates are, however, a little less to Philadelphia, Baltimore and Norfolk. The charges for carrying freight to Europe are the same from all ports on the Atlantic coast.

At Boston, all railroad cargo is moved directly by rail to shipside. At New York, the trunk line railroads must ferry much of their cargo across the Hudson River and the Upper Bay. These waters separate their rail terminals in New Jersey from the docks on the waterfronts of Manhattan and South Brooklyn. This ferrying or "lightering" operation is expensive. Its cost, however, is

Boston and Albany Railroad

Modern Gantry Cranes . . . . These huge cranes can lift extremely heavy loads.

Fay Foto Service Inc.

Cargo Handling

borne by the railroads, and no extra charge is made to the shippers. The ferrying of cargo is not necessary at Boston.

The fact that Boston is not served by any direct trunk line railroad from the Middle West has already been stressed. This has a considerable effect upon the volume of export cargo handled at the port of Boston. The New York Central hauls most of its freight directly to New York, rather than routing it to Boston via the Boston and Albany Railroad. Partly for this reason, Boston's export cargo is only a small fraction of its imports. As a result, ships discharging at Boston are not always able to pick up a return load. The situation is improving because of steps taken by the Port Authority to attract new business.

Many products manufactured in Connecticut and central Massachusetts — particularly machinery and electrical goods — are hauled by the New Haven railroad to New York for export rather than to Boston. In a pre-war year, only 14 per cent of New England's exports moved via Boston. This can be corrected by persuading New England manufacturers to specify that their merchandise be shipped through New England's logical ocean gateway and greatest port.

A major reason why so much New England freight has habitually been routed to New York is because the greatest port in the United States can naturally offer more frequent sailings of ships to foreign countries. Boston cannot hope to attract as many ships as New York. Boston's answer is to increase schedules to the point where there will be no serious delay between sailings for principal overseas ports. Fifty different steamship lines were serving Boston in 1947. Twelve of these were newcomers during that year.

Coastal and Intercoastal Shipping

Before World War II, there was a large and prosperous coastal shipping business between Boston, Philadelphia, Baltimore and other east coast ports. Also, many ships from Boston went through the Panama Canal, carrying freight between the east and west coast ports. This latter traffic is referred to as "intercoastal shipping." These two kinds of domestic water-borne commerce have not regained their pre-war volumes. Most of the

Fay Foto Service Inc.

Loading Grain

ships were taken over by the federal government to carry military supplies. Some were sunk. Others are now engaged in foreign trade.

Another reason for the decline of coastal and intercoastal service is that the cost of operating ships is now much higher than before the war. Ship operators find it difficult to compete with the railroad rates for carrying the same goods overland.

Highway Access to Boston's Piers

A visitor to the waterfronts of Boston's port will be impressed by the heavy truck traffic to and from the docks. A prosperous port requires easy access by good streets that are free from congestion. It has previously been pointed out that the separate parts of the port are divided from each other by waterways. The Sumner Tunnel carries highway traffic under the main harbor channel. All the other waterways are crossed by bridges. Some of the worst traffic congestion in the Boston region is at the Sumner Tunnel and at these bridges. Construction of the new Mystic River Bridge, and the program of express highways proposed by the Governor's Joint Board[1] are very favorable factors for the Port of Boston, and will go far to overcome present traffic difficulties. Though not specifically mentioned by the Joint Board, it will also be desirable at some future time to replace the present bridge over Chelsea Creek. Another important project for the future is to fill in South Bay and Fort Point Channel, thereby eliminating the present movable bridges, which delay traffic by being opened many times a day to let ships and barges pass through. In addition, some streets in South Boston need to be widened to provide better access to Castle Island and the Army Base.

Because of the increasing volume of port cargo that is moved by truck rather than by rail, these street improvements and water crossings take on added importance. By building modern express highways and by constructing better piers, Boston will obtain the physical facilities of an efficient port, saving time and money in the handling of cargo and ships. The port of Boston will then be in a strong position to attract much increased tonnages of freight and many more ocean-going ships.

Cargo Handling *Fay Foto Service Inc.*

[1] See page 195 ff.

AVIATION

Types of Air Service

As the airplane is the newest and the fastest growing form of transportation, its future needs are the most difficult to foresee and to grasp. A large number of adequate airports and landing fields is evidently the greatest need. Requirements can be understood better by first considering the different kinds of aviation service:

Commercial Passenger Transport — scheduled service[1]
Passenger transport — non-scheduled service[1]
Air Taxis — non-scheduled
Mail
Cargo and air express — scheduled and non-scheduled
Army, Navy and Coast Guard aviation
Testing of new types of planes
Photographic and other special services
Flying instruction, and demonstration and sales of private airplanes
Private flying

Obviously, it would cause great confusion to attempt to use any one airport, however large, for all the above types of service. It is now recognized that the Army, Navy and Coast Guard should have fields that would be used exclusively by the armed forces, except in emergencies. Private flying, instruction and demonstration require only small fields, and should not be permitted at airports designated for commercial transport flights. Testing new planes is generally done at fields operated by aviation manufacturing companies. Photographic and special service planes can utilize the same small fields as the privately owned planes. Air taxis shuttle between small landing fields and the major airports.

We thus find that the major airports can be almost entirely limited to commercial passenger transport, freight and air express, mail, and air taxi service. We can list five main types of commercial transport service for Boston:

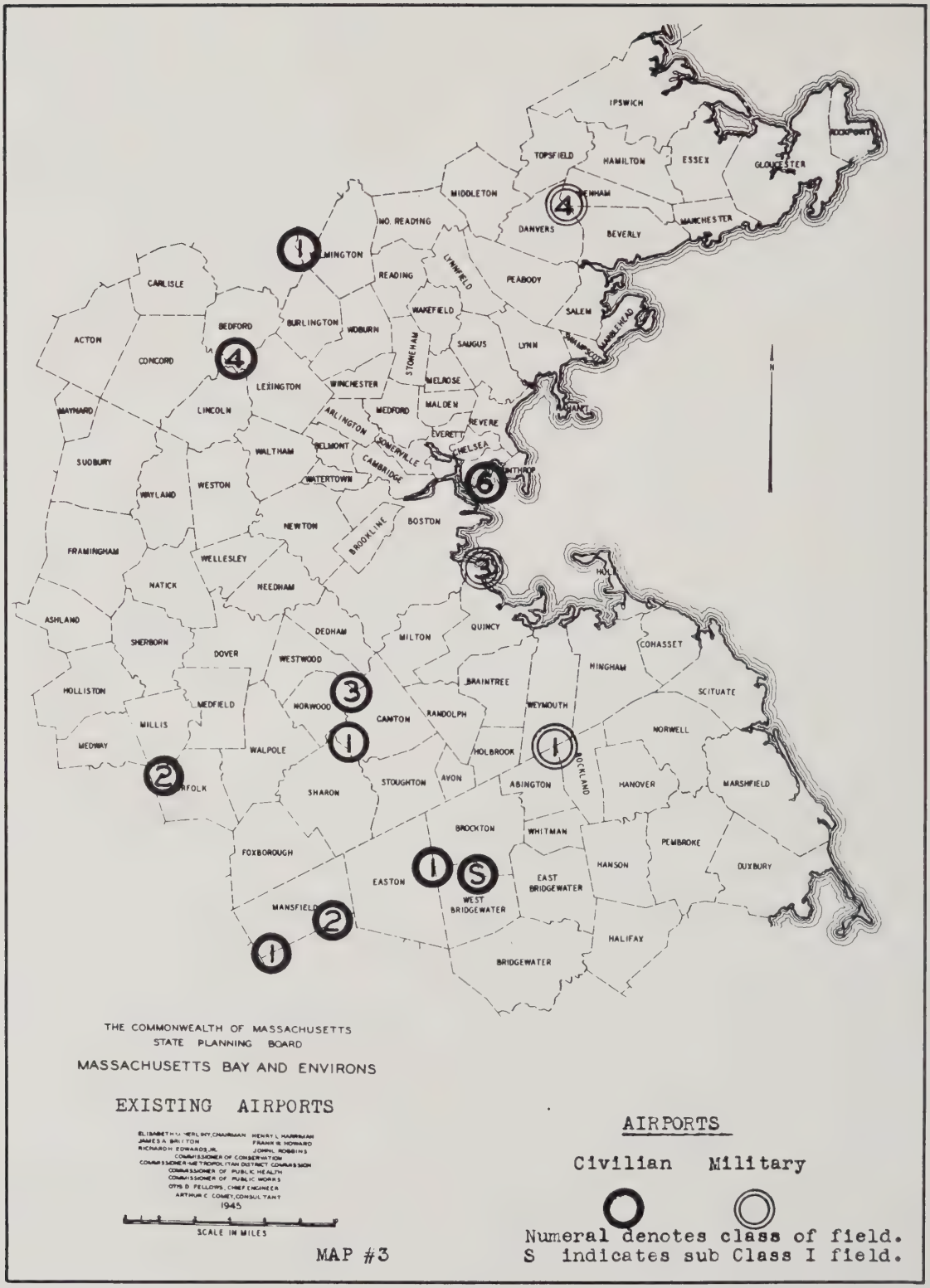
1. Overseas operations
2. Main trunk lines between principal American cities such as Boston, New York, Chicago and San Francisco
3. Local trunk lines with intermediate stops at cities of the size of Worcester, Springfield and Hartford
4. Passenger feeder lines and taxi service from small cities such as Brockton, Lowell and Lawrence
5. Pick-up service for air mail and freight from towns that do not need scheduled passenger service.

It is also possible that commercial airports may be designated in the future either for passenger or for cargo service exclusively.

Existing Airfields in the Boston Region

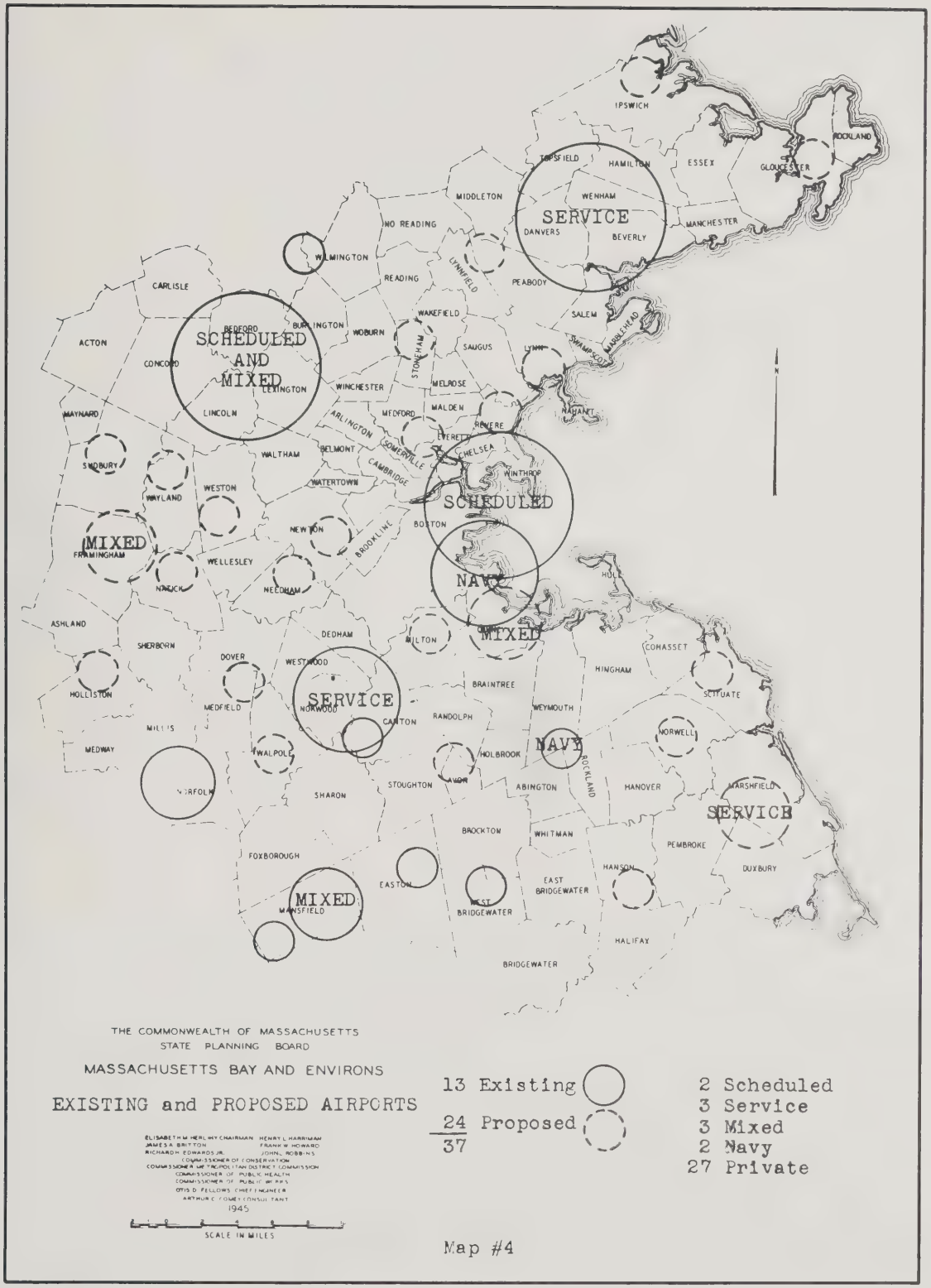
With this general background of types of service, let us examine our present airfields. Prior to World War I, there were none in the Boston region. During that war a small state field at Framingham came into limited use. The Naval Reserve Air Station at Squantum was established in 1923; and in the same year, the present East Boston airport was first opened. Boston's air mail service began in 1926, and regular passenger service in 1929. By 1947, the Boston region had a total of 14 airfields, of various sizes and classifications. These are shown on the accompanying map.

[1] Throughout this discussion, the term "scheduled" refers to flights that are listed in timetables and take place regularly unless weather prevents. "Non-scheduled" service includes passenger flights that are arranged by the private chartering of planes, and cargo flights that leave whenever loads are available.



State Planning Board

Existing Airports in Boston Region . . . . The numerals denote classes of fields. The largest, Logan Airport, is Class 6. Small fields for private flying are Class 1.



THE COMMONWEALTH OF MASSACHUSETTS
STATE PLANNING BOARD

MASSACHUSETTS BAY AND ENVIRONS

EXISTING and PROPOSED AIRPORTS

ELISABETH M. HERLIHY, CHAIRMAN — HENRY L. HARRIMAN
JAMES A. BRITTON — FRANK W. HOWARD
RICHARD H. EDWARDS, JR. — JOHN L. ROBBINS
COMMISSIONER OF CONSERVATION
COMMISSIONER METROPOLITAN DISTRICT COMMISSION
COMMISSIONER OF PUBLIC HEALTH
COMMISSIONER OF PUBLIC WORKS
OTIS D. FELLOWS, CHIEF ENGINEER
ARTHUR C. COMEY, CONSULTANT

1945

SCALE IN MILES

13 Existing
24 Proposed
37

2 Scheduled
3 Service
3 Mixed
2 Navy
27 Private

Map #4

State Planning Board

Airport Master Plan for Boston Region

General Edward Lawrence Logan Airport is being enlarged and improved for commercial transport use, domestic and overseas, including passengers, freight, air express and mail. It is fully described in a later section of this chapter.

Bedford Airport (*Hanscom Field*) was developed during World War II exclusively for the Army. It has three runways, each nearly a mile long. In 1946, it was returned to state ownership, with partial Army use continued. It ranks second only to Logan for commercial operations.

Beverly and *Norwood* are municipal airports, which were extensively improved for military operations. Beverly has three runways of 3500 to 5000 feet; and Norwood has two 4000-foot runways. Both are suitable as supplemental commercial transport fields.

Squantum and *South Weymouth* are exclusively U.S. Navy fields.

The remaining eight fields are all of limited size and facilities. They are suitable for private flying, instruction, demonstration flights, and taxi service to Logan Airport (see map).

State Planning Board's Airport Program

The State Planning Board undertook a thorough study of the growth of private flying and commercial transport, and published its report in 1946.[1] The board believes that there will be some 3000 private planes in the Boston region by 1955. It recommended that airfields for this type of service should each be able to store about 100 planes, and that sites should be acquired for 24 additional small fields to supplement the seven then existing.[2]

The accompanying map indicates places where these future fields might be established. The State Planning Board points out: "The general location map must not be construed to mean that airports are definitely planned for each specific location or even those towns indicated. Airports are not likely to be constructed in municipali-

[1] Airport Program for Massachusetts Bay and Environs, State Planning Board, April 1946.

[2] Since the time the State Planning Board issued its report, one additional field for private flying — Revere — has been placed in operation.

Loading Air Freight

American Airlines Inc

ties which do not want them. The map is intended to show where airports *could* be built and the general area where they will be needed."

With respect to commercial aviation, the State Planning Board's recommendations may be summarized as follows:

General Edward Lawrence Logan Airport: develop for domestic and overseas commercial scheduled flights of the largest plane types; service to include freight, air express and mail, as well as passengers.

Bedford Airport: to be used as the principal supplemental field for all types of commercial scheduled flights. Bedford would take the overflow from Logan, if the latter becomes crowded. When Logan is fog-bound, its scheduled arrivals and departures would be shifted to Bedford. Bedford may also be used for non-scheduled commercial flights; for military reserve training; and possibly for sales distribution and servicing of planes for all New England.

Beverly, Norwood and *Mansfield:* to be used for commercial non-scheduled flights. Norwood is also suitable as a supplemental field to Logan.

Squantum and *South Weymouth:* to continue as U.S. Navy fields. South Weymouth could be used, if necessary, as a standby field for Logan.

Development of Logan Airport

Boston's great commercial airport on the shore of the harbor was named for the late General Edward Lawrence Logan, prominent Boston jurist and military commander. Originally built by the Commonwealth, it was leased to the City of Boston in 1928 for development as a municipal field.

In 1945, the city returned it to the state, which undertook to enlarge and improve the airport for both domestic and international service. By leveling islands and filling in shallow waters, the area of the airport has been increased to 1300 acres. Its ultimate size is to be 2000 acres. The current construction program includes four runways of approximately 7000 feet each. One of these is to be extended to 10,000 feet in the near future. Another may be similarly lengthened. All runways have 300 feet of paved width. Two additional runways can be added if necessary. In 1947, there were a total of 15 loading stations. The program calls for 16 new stations, spaced around the new administration building unit (see illustration). Logan will be one of the largest airports on the eastern seaboard.

While Logan is used principally for commercial transport aviation, the National Guard maintains limited facilities. It may eventually shift its operations to another field. No private flying is permitted.

Logan Airport has the very great advantage of being only one and one-half miles from the center of downtown Boston. Actual driving time, using the Sumner Tunnel, will be a matter of seven minutes when the new express highway connections are constructed. It is possible to reach Logan Airport now in about 10 minutes, but only when there is no traffic congestion. Boston can take pride in having the best situated major airport of any large city in the United States.

It has been estimated that the number of commercial passengers at Logan will increase to nearly 3,200,000 by 1956, as compared with about 1,100,000 in 1947, 947,460 in 1946, and less than 300,000 in 1941. The

Logan Airport

Logan Airport . . . . Drawing of completed field. Planes will load and unload on the "apron" (shown in white) around the roughly star-shaped Administration Building.

1947 air freight and express at Logan amounted to 10,000,000 pounds. As the air cargo business is still in its infancy, it would not be surprising to see this figure pyramid to 20 or even 25 times its present total within 10 years.

Air mail is also on the increase, though to a less marked degree. In 1946, there were over 2,300,000 pounds of mail handled at Logan. The State Planning Board estimates that this will increase to nearly 6,000,000 pounds in 1956, of which almost one-third will be overseas mail.

Helicopters

One of Boston's large stores inaugurated the scheduled delivery of merchandise and mail by helicopter in 1946 and continued this pioneer service well into 1947. Package deliveries were made between branch stores in Belmont, Winchester and Wellesley, and mail was flown to the South Postal Annex in Boston.

In 1947, the first regularly scheduled helicopter passenger service in the United States was established between Logan Airport and the roof of a building in Park Square, Boston. These helicopters carried only three persons and a small amount of hand baggage in addition to the pilot. This was not a sufficient pay-load for profitable operation on such a very short flight (about two and one-half miles). After some months, the service had to be discontinued. Much larger helicopters are now being developed, and methods have been found for reducing their noise. Boston and other cities may look forward to scheduled helicopter service as a regular feature of their air transport systems.

Merchandise and Mail Delivery by Helicopter . . . . Boston Post Office building is in center.

VI.

BUSINESS AND INDUSTRIAL DISTRICT PROPOSALS

BUSINESS

Although Greater Boston ranks fifth in population among the metropolitan districts of the country, it is the third largest wholesale market. As further proof of wealth and importance, its average retail sales per person[1] are greater than in any other metropolitan region.

Downtown Business Center

The location of Boston's main business center was fixed years ago by the geographic pattern of the rivers and harbor, by the early highways converging upon it, and later by the railway and transit lines. It is a logical location. There is scant likelihood that the main business center will move, because no other area could be made so easily accessible by so many different means of transportation.

Within the downtown center of Boston, there are many separate districts devoted to various types of business. Their boundaries are by no means clearly defined, as there is much overlapping. In general they occupy the areas shown on the accompanying map.

The permanency of location of Boston's main retail district is in sharp contrast to what has happened in New York, where the retail district has been on the march uptown for many generations.

One of Boston's main department stores has planned the first section of a large new building on the same site it now occupies. Another principal store has signed a lease to maintain its present location for a long term of years and to modernize its plant. These two decisions give additional evidence of the stability of Boston's retail district. They will also help to anchor it by influencing many other stores and business firms to remain where they are. Another contribution to the permanence of Boston's downtown center is the new building of the New England Telephone and Telegraph Company, fronting on Post Office Square. Also, the nearby Federal Reserve Bank is planning a substantial addition to its present building.

New England Telephone and Telegraph Company . . . . Note building set-backs to assure ample light and air for this structure and surrounding properties.

[1] Total dollar value of all retail sales for a full year, divided by total population of the Metropolitan District.

Principal Districts of Downtown Boston

The Boston Common and Tremont Street . . . Parked cars reduce street capacity for moving traffic.

Property Management Corp

Tower Building

Traffic Congestion in Central Boston

Downtown Boston's maze of narrow crooked streets is unique in the United States. The traffic congestion they create is by no means unique. It is recognized that this congestion seriously affects the continuing prosperity of business firms and retail stores. Though technically a traffic problem, it is also a business problem. The solutions have already been fully discussed.[1] Let us summarize them for purposes of emphasis:

1. Enforcement of parking regulations
2. Further restriction of curb parking, to make more street space available for moving vehicles
3. Creation of off-street parking facilities — as many as 10,000 more spaces may be needed
4. Provision of off-street loading bays for trucks in large new buildings; and garages within or adjoining these buildings when practical
5. Construction of a Belt Route expressway including the Central Artery, with minor improvements to surface streets that connect with it
6. Construction of a modern surface street underneath the elevated sections of the Belt Route

All the above measures are necessary to provide the physical framework for the continued prosperity of central Boston. The problem is too big to be solved by carrying out only a few of these recommendations.

Union Motor Truck Terminals

Many of the articles we buy in downtown stores are brought to those stores by trucks that come from out-of-town factories. A large truck may carry merchandise to ten or more different stores. And many separate factories make truck shipments to the same store.

The Boston City Planning Board has recommended a way to simplify these multiple deliveries. If all the large out-of-town trucks unloaded at union motor truck interchange terminals, small local trucks could then reload the merchandise in such a way

[1] See page 192 ff.

Boston Globe ↑

Congestion in Dock Square . . . . Traffic delays increase the prices of food. The Belt Route express highway is designed to lift a great deal of the traffic off these surface streets.

Boston Traffic Commission ↑

Truck Backing into Off-Street Loading Bay

A Motor Truck Interchange Terminal . . . . Large trucks from out-of-town unload into small trucks for local deliveries. The Boston Planning Board has proposed two big terminals of this kind. *Cheyne Aerial Surveys* ←

as to carry a full load to one store. They would also be able to pick up a return load and bring it back to the terminal, where it could be sorted and reloaded into large trucks for transport to other cities.

To keep the big truck-trailers out of downtown Boston as much as possible, the board suggests that instead of constructing a single terminal in a very central location, it would be better to construct one in Charlestown, and a second in South Boston.

In Boston, the City Planning Board found that delivery and pick-up trucks in the downtown area are carrying, on the average, less than half their full capacity. There are at least 2,000 trucks belonging to trucking companies engaged in this work. Every day, they handle about 7,200 tons of small consignments, and travel a total of 30,000 miles on our downtown streets. Although this mileage may appear to be great, it is an average of only 15 miles per truck.

If Boston had one or more large union truck terminals, the board's figures show that truck traffic on the streets could be very much reduced, thus cutting down one of the principal causes of congestion. Another advantage would be a substantial saving in trucking costs.

Market District

Boston's wholesale meat and produce market is situated in the area between Faneuil Hall and Atlantic Avenue and extends northward along adjacent streets. In the judgment of the City Planning Board, the market should be retained where it is now. Proposals have been made for shifting the market to South Boston, but it is generally considered that the possible advantages of greater site area for development would be

offset by the sacrifice of central location and accessibility from all directions.

Rather than shifting the market, it seems better to plan for the replacement of present obsolete market buildings by modern structures, together with the opening up of more street area for local circulation of vehicles. The proposed Belt Route skirts the market district and will do much to relieve congestion caused by truck travel to and from this area.

Park Square Business District

This important secondary business center has grown up principally during the past 25 years. Some of the buildings are on the site of an abandoned railroad yard. The district is more readily reached by streets and highways from the west than downtown Boston. The street car lines under Commonwealth Avenue, Beacon Street and Huntington Avenue converge along Boylston Street, so that Park Square is reasonably well served by rapid transit. It does not, of course, have the network of lines that makes our main business center so easy to reach from all directions. An advantage of the Park Square district is that it has a greater concentration of off-street parking facilities than downtown Boston. These include an eight-story garage.

The principal types of business in this area are hotels, insurance companies, general offices and small exclusive shops. The most recent large structure to be completed is the new John Hancock Life Insurance building. The air lines maintain offices at Park Square, and several long distance bus lines have terminals there.

Fairchild Aerial Surveys, Inc.

The Park Square Business District . . . . Note new John Hancock building in center.

Fay Foto Service I

New England Mutual Life Insurance Company . . . An imposing building with its tower well set bac from the street front. This structure includes its ow garage.

Dedham Center Business District . . . . In 1947.

Dedham Planning Board, Photo by Stier
Arthur A. Shurcliff and Sidney N. Shurcliff, Consultants

As replanned to provide for through traffic and increased parking space.

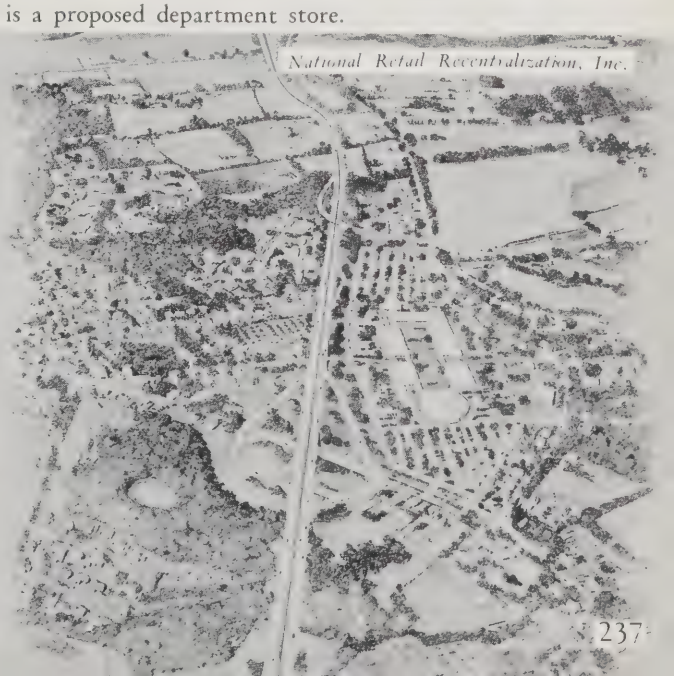
Suburban Business Centers

Each of the cities and towns in the Boston region naturally has its own local business center. Some municipalities, of which Newton is an example, have several. The increased ownership of automobiles, and the congestion they have caused in Boston's main business district, have made these suburban centers increasingly important. Being much easier to reach by motor car, they attract shoppers from residential areas for many miles around. There are significant examples in Arlington, Belmont, Brookline, Malden, Newton, Quincy, Waltham, Wellesley and Winchester.

To avoid loss of trade, some of the large downtown Boston stores have established branches of considerable size, often with their own parking spaces, in several of the more important business districts outside the city. This makes shopping more convenient for many customers. It encourages the healthy development of independent communities as distinct from "dormitory suburbs," and helps to achieve a desirable *balance* between the strength of the central city

A Neighborhood Parking Space . . . . Necessary for a small shopping center.

Shopping Center, Planned for the North Shore . . . . Circular building is a proposed department store.



and the prosperity of the surrounding towns. The trend is well established. However, suburban centers cannot replace our downtown retail district. There, the parent stores can offer a far greater range of merchandise, and the shopper can visit many more stores.

A recent advance in suburban development is the creation of large new shopping centers at a distance from the long-established local business districts. Several such centers are being planned in the Boston region. One of these will be to the north, and another to the west of the city. Their distinguishing feature is the selection of large sites of many acres, accessible by main highways. The sites are planned as a whole before construction starts. Space is specifically set aside for offices, restaurants, theaters, 25 to 50 small stores, and one or more department stores. Parking areas for several thousand automobiles are laid out at convenient locations. The various buildings and parking spaces may be connected by covered passageways.

INDUSTRY

In value of manufactures, Greater Boston is the nation's fifth largest industrial center, and is noted for the wide variety of its products. The U. S. Department of Commerce has established a classification list of about 350 separate industries, of which more than 250 are represented in the Boston region. This exceptional diversification is a great advantage. It gives reasonable assurance of employment opportunities for our industrial workers. Only in the worst depression years are all manufacturing plants likely to be badly affected at the same time.

Hood Rubber Company, Watertown, Mass. . . . . An industry with many buildings on a large site. Note company parking space for employees automobiles. *Cheyne Aerial Surveys*

Industrial Locations

The industrial districts where manufacturing activity is concentrated are indicated by the red areas on the map on page 243. This map also shows the railroad lines because industries and railroads are mutually dependent.

Residential buildings can no longer be constructed in Boston's heavy industrial districts. This is a zoning prohibition designed to prevent one of the worst of jumbled land uses. Sometimes an industrial district can be insulated from an adjacent residential neighborhood by having a park between them. This type of separation is very desirable and effective. A good example is the Christopher Lee Playground on First Street, in South Boston.

Suggestion for a Planned Industrial District in the South Bay Area

We have previously discussed the establishment of specially designed industrial centers, organized under one management.[1] This type of development is particularly advantageous for small light industries, but it also meets the needs of medium-sized heavy industries.

Construction of such a planned industrial district has been proposed for the extensive South Bay area between the South End and South Boston. This vast tract of more than 300 acres, now mostly vacant but used to a limited extent for railroad yards, is four times the size of the Boston Common and Public Garden combined. This land, literally on the doorstep of downtown Boston,

[1] See page 107.

Boston's South Bay District . . . . Fort Point Channel leads from harbor in upper center into the South Bay at left. Railroad tracks and yards occupy part of this little used area.

is readily accessible by both highways and railroads. It is also close to the docks of the South Boston waterfront. The project would fill a very definite need, for into its new factories could move many of Boston's industries, which now occupy antiquated structures in congested sections of the city. The accompanying sketch shows how the site might be developed, but no detailed plans have been prepared.

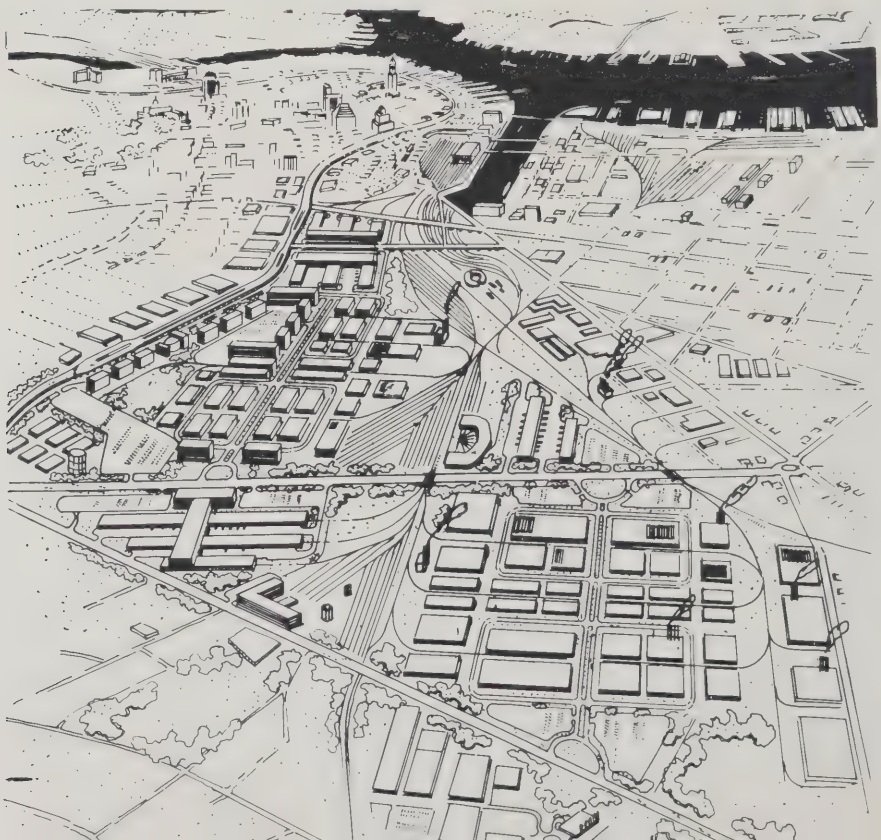
Proposal to Fill in South Bay and Fort Point Channel

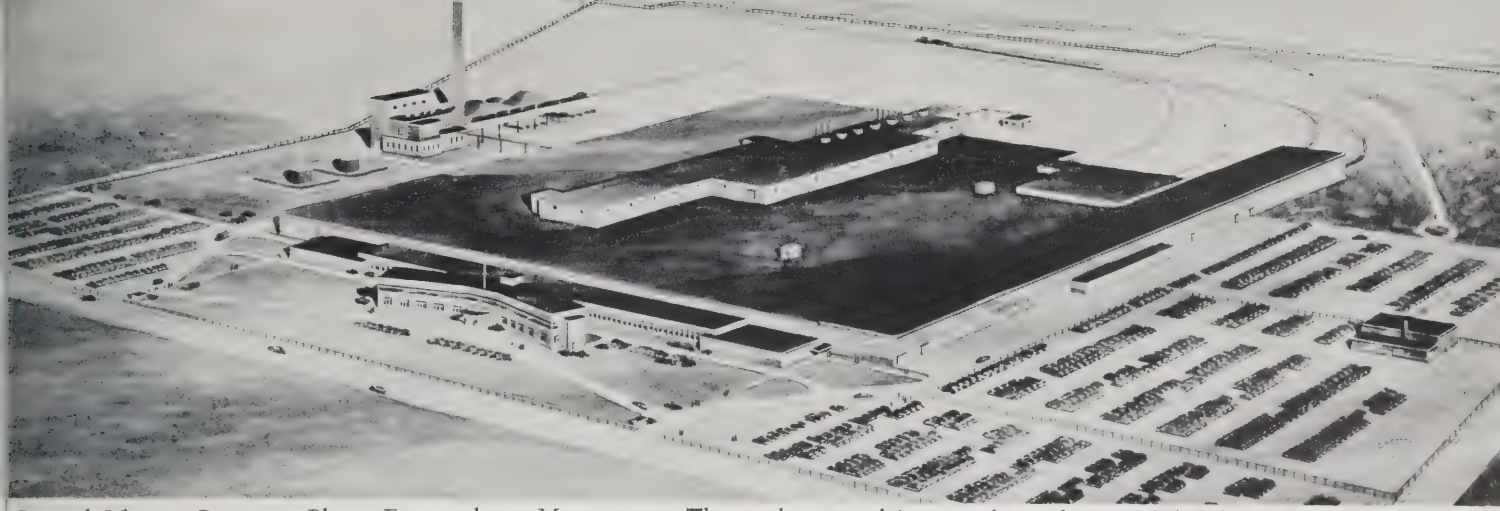
The filling of the South Bay and the Fort Point Channel has been recommended many times. This project was mentioned when we discussed the delays to truck traffic caused by opening the bridges.[1] Although it would benefit the suggested South Bay Industrial District, the two proposals are not dependent upon each other. Either could be successfully carried out alone.

There are now very few industries on these waterways that require service by ship or barge. With careful planning and cooperative action, it should be possible for them to find more suitable locations. On completion of the project, South Boston and Boston proper would be one continuous area of land with all the advantages of easy access to each other. The bridges would be demolished, the expense of operating them would be saved, and traffic congestion eliminated. The new land would be available for automobile parking and industrial buildings. It might also serve in part as the right-of-way for a section of the proposed Belt Route expressway.

[1] See page 224.

Suggested South Bay Industrial District Development . . . . The proposed manufacturing buildings would have both rail and highway access. This sketch shows the South Bay filled in, and Fort Point Channel remaining as a waterway. The latter could also be filled.





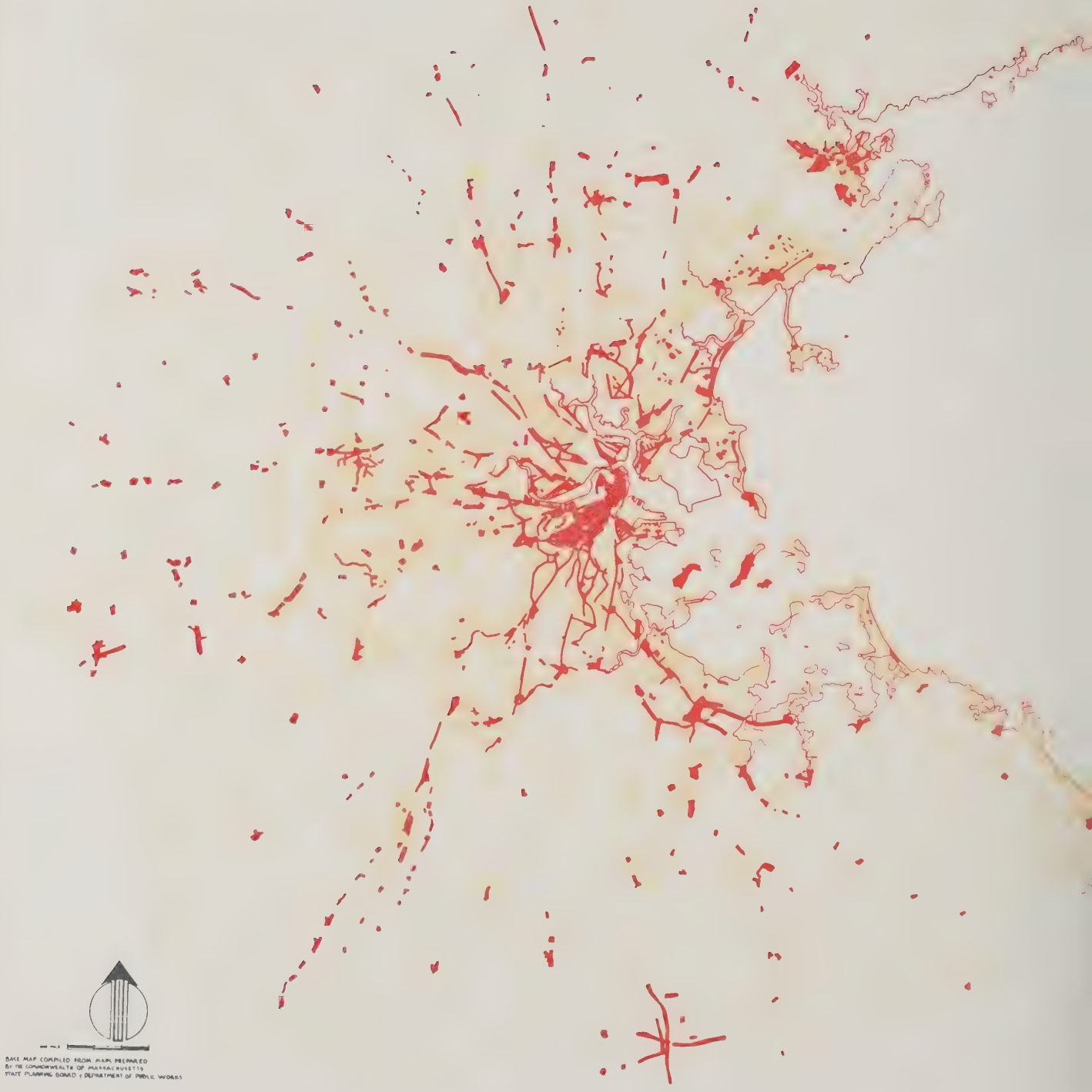
General Motors Company Plant, Framingham, Mass. . . . . The modern trend is towards single manufacturing buildings, mostly of one story construction, extending over a large area with ample surrounding space for automobile parking and freight handling.

Industry in Open Country

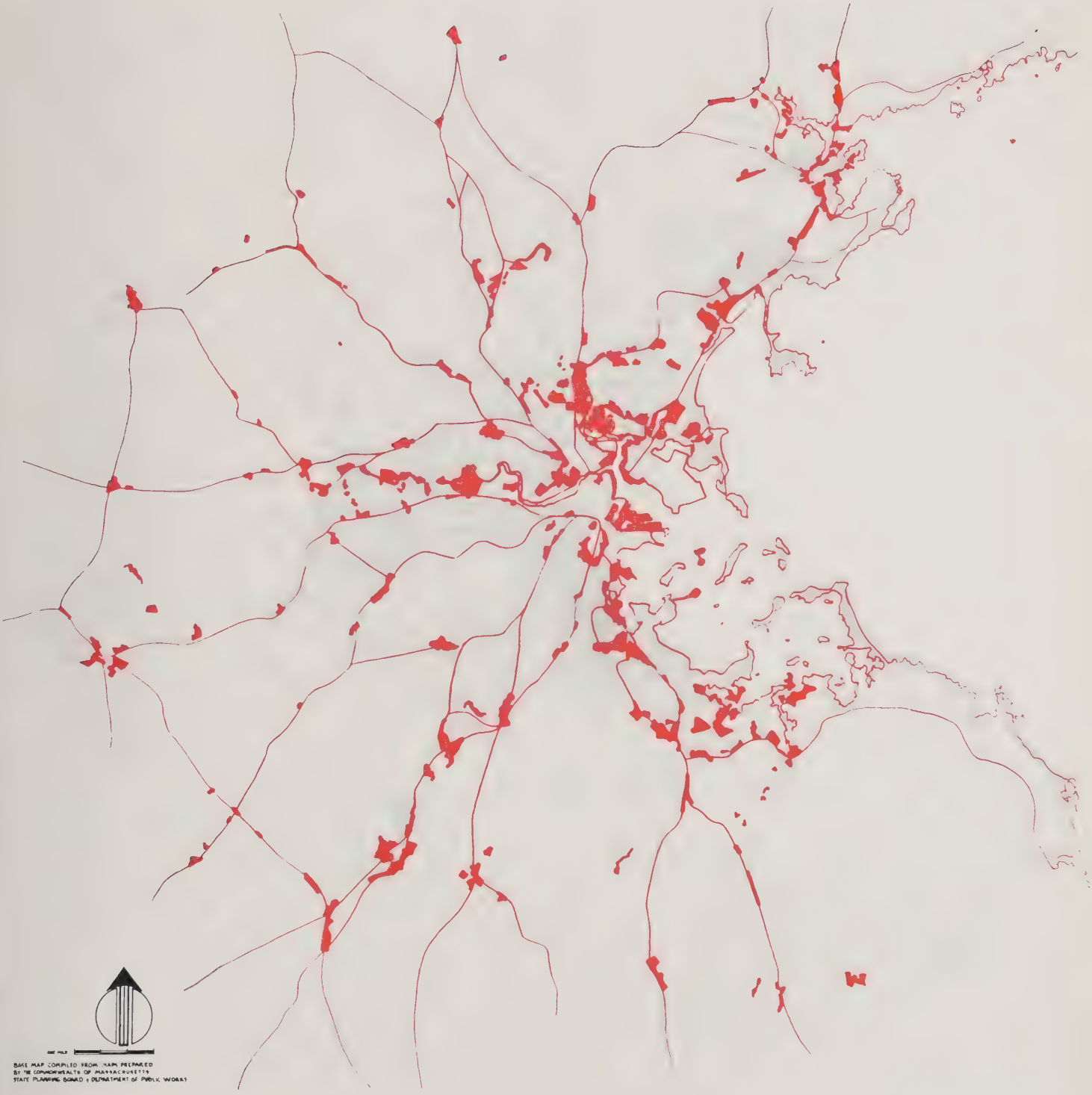
There has been a tendency for many years to locate large heavy industries entirely away from the congestion of big cities. By selecting sites in open country, any desired acreage of cheap land is readily obtainable. If the industry needs to expand its plant, it can do so without difficulty. Employees can commute by bus, or drive their own cars and leave them in company parking lots. The United Shoe Machinery Company in Beverly is a good example of this type of development. Another instance is the new General Motors assembly plant in Framingham (see photographs).

In September of 1947 the plans for the Boston-Newton Industrial Center were announced. This new outlying project is designed to have an eventual 600,000 square feet of floor area in a group of buildings planned for modern efficiency of operations. Tenancy is expected to include both small and large firms.

United Shoe Machinery Plant, Beverly, Mass. . . . . An example of a large industry in open country.


BASE MAP COMPILED FROM MAPS PREPARED
BY THE COMMONWEALTH OF MASSACHUSETTS
STATE PLANNING BOARD & DEPARTMENT OF PUBLIC WORKS

Principal Areas Zoned for Business in Boston Region . . . . Note the "ribbons" of business zoning extending along main thoroughfare


BASE MAP COMPILED FROM MAPS PREPARED
BY THE COMMONWEALTH OF MASSACHUSETTS
STATE PLANNING BOARD & DEPARTMENT OF PUBLIC WORKS

Principal Areas Zoned for Industry in Boston Region . . . . On this map, the red lines are railroads. Note that most of the industrial areas are accessible by rail. The map also shows airports.

VII.

PARKS, PUBLIC BUILDINGS AND SCHOOLS

PARKS

The City of Boston's Park System

Boston is world famous for its fine parks. In this respect, it ranks with London, Paris, New York and Chicago. The Boston Common is generally considered to be the first park in America. It was set aside for the joint use of all the settlers only four years after Boston was founded. Its area today is about 50 acres, a little less than the original size. The Public Garden, 24 acres in extent, was once part of the Back Bay tidal area, as mentioned before, and was not actually dry land until 1859. The old shore line was along Charles Street, which now separates the Common from the Garden.

In 1875, Boston's first board of park commissioners was appointed. In the succeeding 25 years, the city's park system was expanded to well over 2,000 acres, including about 40 miles of connecting boulevards. It was in this period that the city acquired the Charlesbank, Fenway, Jamaicaway, Arborway, Franklin Park, Marine Park, Arnold Arboretum, Columbus Park and the Strandway.

During the 20th Century, much progress has been made in adding to the number of small quiet parks and children's playgrounds. In 1947, the city's park system totalled 3,085 acres, divided as follows:

34 Parks and Parkways[1]	2,394 acres
87 Playgrounds not in parks[2]	632 "
83 Public Grounds and Squares[3]	59 "

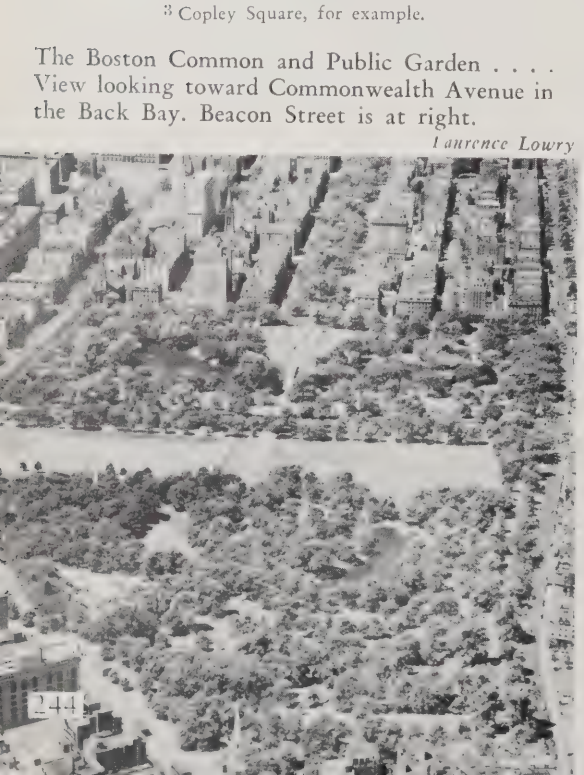
[1] This includes Cummings Memorial Park, 234 acres, situated in the towns of Woburn and Burlington but owned by the City of Boston.

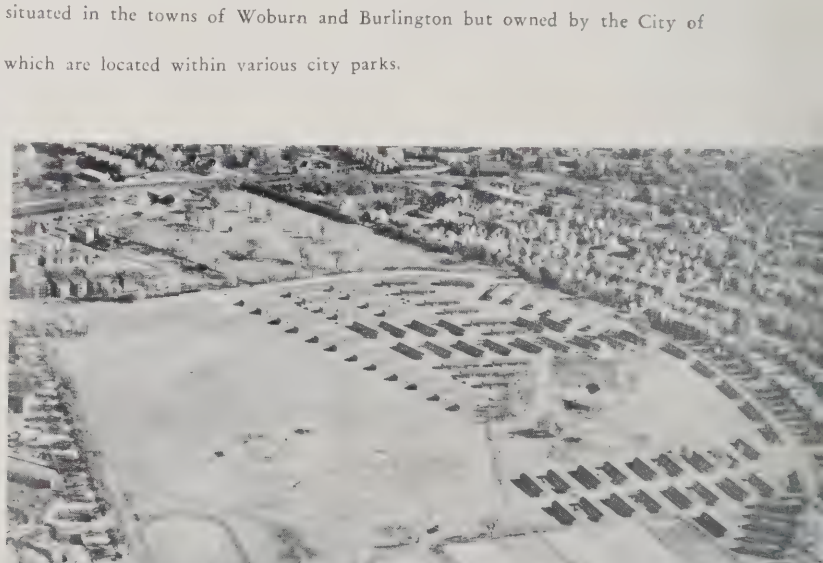
[2] There are 14 other playgrounds totalling 174 acres, which are located within various city parks.

[3] Copley Square, for example.

The Boston Common and Public Garden . . . . View looking toward Commonwealth Avenue in the Back Bay. Beacon Street is at right.

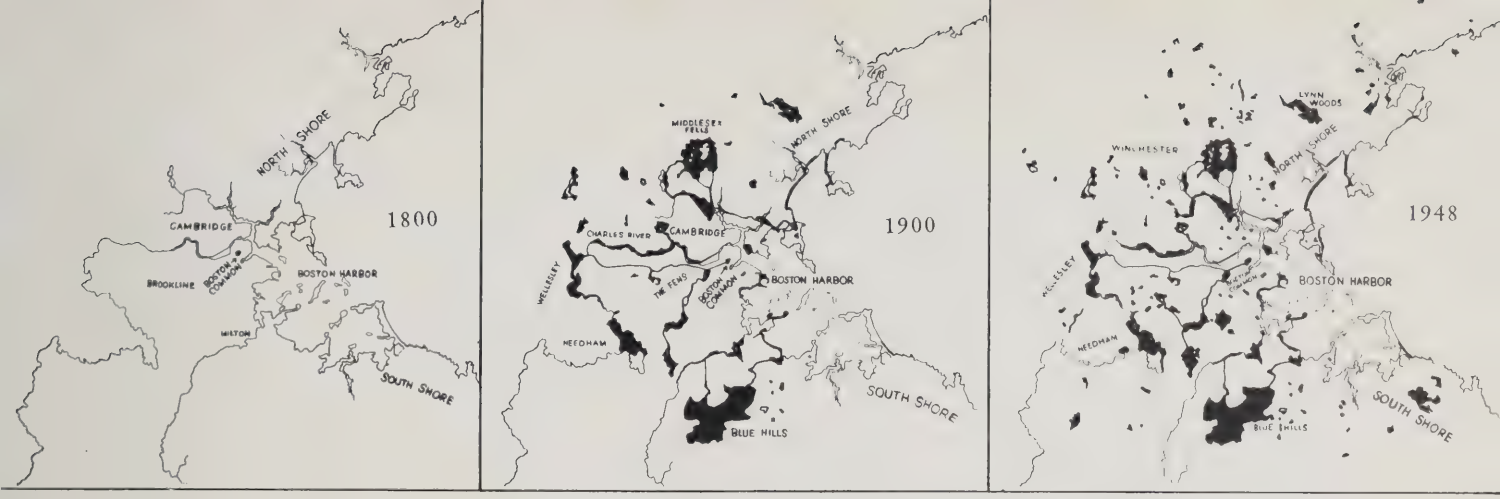
Laurence Lowry





Fairchild Aerial Surveys Inc

Franklin Field, Boston . . . . Note temporary government housing on this well-known athletic field.



The Regional Park System — Pattern of Growth

The park acreage amounts to 11 per cent of Boston's total land area. This proportion is larger than in most cities. However, it is not altogether fitting to make comparisons solely on the basis of percentages of city area, as the *distribution* of parks and playgrounds by neighborhoods is even more important.

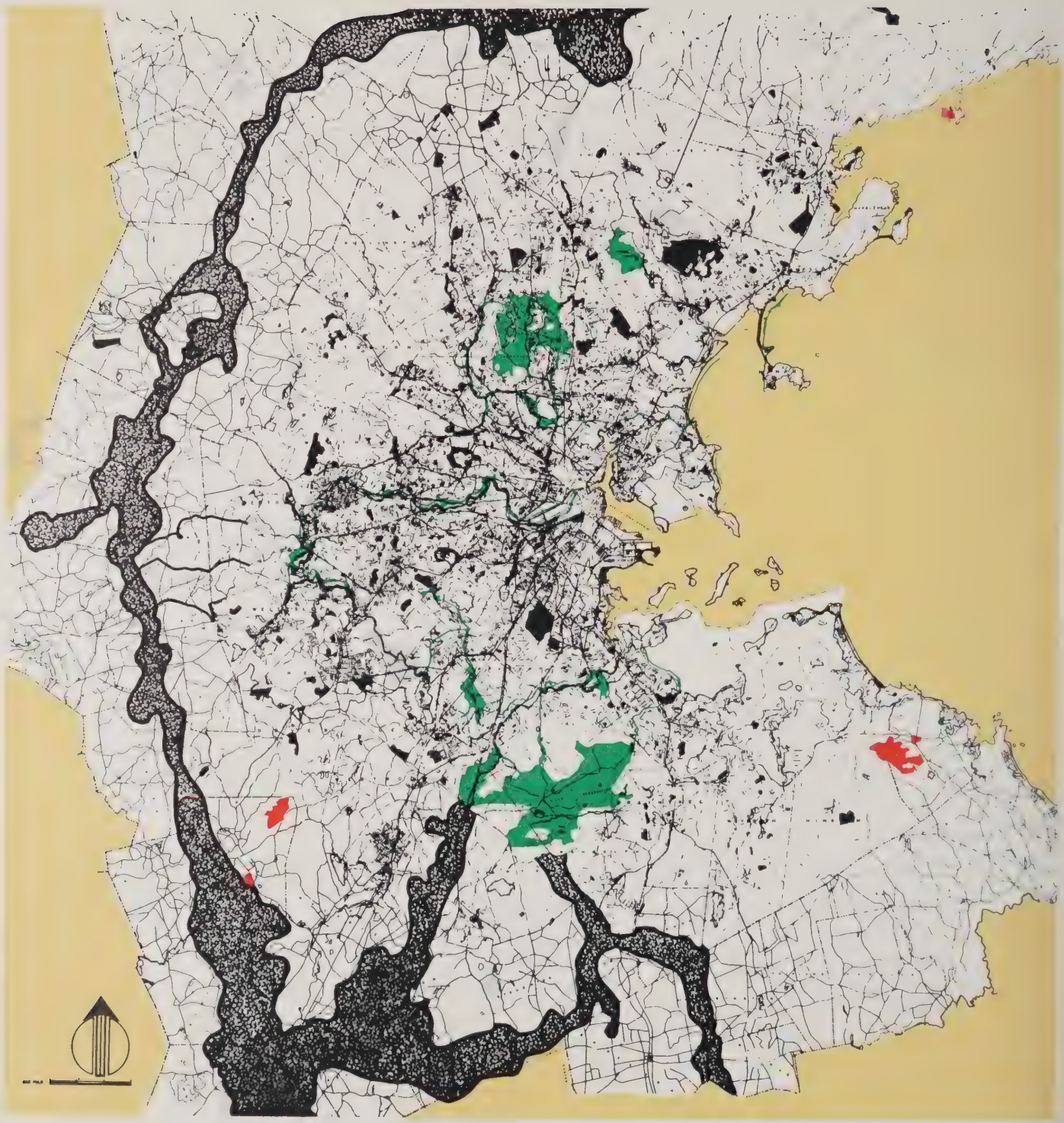
Boston's total playground area, including playgrounds within parks, is 806 acres, or about one-quarter of the entire city park system. This is a good proportion, though a little lower than what might be considered ideal.

During the course of the years, the Boston region has made three very notable contributions to the science of park development and operation. The first was the idea of preparing a long-range plan for the location of municipal parks and connecting boulevards, rather than merely obtaining odd pieces of open land, unrelated to each other and to the pattern of the city's growth. This plan was prepared by the original park commission in 1875; and the park lands were acquired gradually *after* the plan had been completed. The second contribution was to create special park areas for athletics and organized play. Charlesbank, opened in 1883, was the first public outdoor playground in the United States. Boston's third great contribution was the establishment of the Metropolitan Parks District. See sketch maps showing pattern of growth of park lands.

Parks District of the Metropolitan District Commission

The Boston park system made such a favorable impression on the surrounding cities and towns that in 1893 the State Legislature created the Metropolitan Parks District. This new regional agency was given power to lay out and acquire open spaces and parkways in any municipality near Boston that desired to become a part of the district and to share the costs of the program. In 1919, the district was combined with other re-

The Back Bay Fens . . . . a part of the City of Boston's extensive system of parks. *Ewing Galloway, N.Y.*



Parks, Parkways and Public Reservations . . . . Note the proposed Bay Circuit and the extensive areas under the jurisdiction of the Metropolitan District Commission.

MUNICIPAL PARKS

PARKS AND PARKWAYS OF METROPOLITAN DISTRICT COMMISSION

STATE FORESTS, WATER WORKS, ETC.

PROPERTIES OF THE TRUSTEES OF PUBLIC RESERVATIONS

BAY CIRCUIT PARKWAY PROPOSAL

Ewing Galloway, N.Y.

The Charles River Basin . . . . Embankment Road is in foreground.

Fay Foto Service Inc.

Hatch Memorial Shell, Esplanade and Embankment Road . . . . Longfellow Bridge is in background.

gional agencies under the present Metropolitan District Commission. An important objective of the M.D.C. is the conservation of natural resources and scenic beauty. A distinctive feature of its work is the attention that has been paid to improving water recreation areas and shore fronts. The Charles River Basin, created by damming the river near North Station, is an outstanding example.

There are fifteen separate "reservations" or metropolitan park properties, totalling 11,219 acres. As will be seen from the accompanying map, they are well distributed through the park district's territory.

Among the more important reservations are:

Blue Hills (the largest)
Breakheart
Bunker Hill
Charles River (including the Esplanade)
Fowl Meadows
Middlesex Fells
Neponset River
Revere Brook
Stony Brook

In addition, the Metropolitan District Commission owns and operates 11 bathing beaches, including:

Lynn-Nahant
Malibu
Nantasket
Revere
Wollaston

Picnic Grounds in the Blue Hills Reservation . . . . The M.D.C. has many such facilities for outings.

Metropolitan District Commission

Nantasket Beach . . . . The three lanes at right, extending for a considerable distance along the beach, are for automobile parking. *Metropolitan District Commission*

Middlesex Fells Parkway *Metropolitan District Commission*

Magazine Beach, Cambridge *Metropolitan District Commissi*

All these metropolitan park properties are readily accessible by public transportation or private automobile. They have been developed for a variety of athletic activities as well as picnicking and quiet relaxation. Because of their popular appeal, they are well patronized, even to the extent of overcrowding in the case of the beaches. There is a recognized need for expansion of the metropolitan park system.

Like many of the main parks of Boston, the metropolitan park reservations are linked together by an extensive system of park boulevards for passenger traffic, with a total length of 113 miles. These include the Fresh Pond, Alewife Brook, Mystic Valley and Revere Beach Parkways. They are planted with trees and some have grass strips in the center. Most of them are crossed by local streets at frequent intervals, and consequently are not the modern type of limited access express parkways, discussed and illustrated earlier in this book.[1] A good many of these boulevards were built before the days of the automobile. By careful redesign, long sections could be converted into express parkways and thus made far more adequate for modern traffic.

Neighborhood Park Planning for the Future

The most urgent outdoor recreation needs in Boston and the larger cities of the region are for more quiet parks, more play lots, more playgrounds and more play fields[2] to serve our residential neighborhoods. Spacing of the present parks and play areas leaves many districts not sufficiently well served. Some neighborhoods have no recreational facilities at all within easy walking distance. In 1941 the City of Boston embarked on a program to correct these shortcomings but the war interrupted the work.

In the same year, the City Planning Board issued a report[3] devoted particularly to the problems of Boston's South End, including housing and health as well as recreation. It revealed that this district has only 5.3 acres of playgrounds for young children, including school yards. The area contains no athletic fields for high school students and adults. And it has only 6.5 acres of quiet parks.

The total population of this area was 41,320 in 1940, of which nearly 4,000 were children of ages from six to 15. It would be desirable for the South End to have:

[1] See page 91

[2] See page 84 for a brief description of these terms.

[3] Building a Better Boston, 1941.

Boston Housing Authority

Neighborhoods Need Playgrounds

15 acres of playgrounds, instead of 5.3 acres[1]
20 acres of athletic fields, instead of none[2]
20 acres of quiet parks, instead of 6.5 acres[3]

The above analysis has been given in some detail so as to stress the importance of planning parks and play spaces for the actual needs of local neighborhoods. A 100-acre park is a splendid place for family outings. But if it is two miles away, it is of no use to five-year-old Johnny on weekday mornings and afternoons. Nor is it of much use to 75-year-old grandfather.

In 1948, the Boston City Planning Board will complete a detailed survey of the playground problem, covering all districts of the city. The board's analysis indicates the districts that are inadequately served.

In 1946 the Cambridge Planning Board made a city-wide survey of park requirements.[4] It reported that the city owned only 119 acres of parks and recreation space, and needed an additional 330 acres. The board emphasized that all new park lands should be properly designed for specialized uses and scientifically distributed through the city's residential areas. During 1947, Cambridge opened four new playgrounds, and sites for others are being acquired.

Trustees of Public Reservations

This is a private incorporated trust, established by the Legislature in 1891, with power to acquire beautiful and historic places in Massachusetts, and to preserve them for the free enjoyment of the public. It occupies a unique place in the recreation field.

The trustees have secured many outstanding properties, which contribute greatly to the system of parks and permanent open spaces in the Commonwealth. They own and care for 23 reservations, totalling 3,612 acres. Most of this acreage is outside the Boston region. Continued improvement of these holdings is a principal objective, and plans are laid in advance for acquisition of additional lands. All work of the trust is financed by private gifts and bequests.

The Bay Circuit Proposal

Because of its continuous population growth and geographic spread, the metropolitan area now extends well beyond the locations of the original metropolitan parks, which were spaced around what was once the rim of the region. Another series of parks is needed, to form an outer belt

[1] The playgrounds should each be at least 3.5 acres in size.

[2] Two athletic fields of 10 acres each.

[3] Quiet parks should have a minimum area of 2.5 acres. Hence, the suggested 20 acres might be made up of about eight separate quiet parks.

[4] Recreation in Cambridge, 1946.

around the larger region of today. This outer belt, known as the "Bay Circuit," was originally proposed in 1925 by the Governor's Committee on Open Spaces, which had been organized through the efforts of the Trustees of Public Reservations. As will be seen on the map on page 246, the suggested Bay Circuit is actually a continuous chain of large parks. It extends from Plum Island on the north, through the Ipswich, Concord and Sudbury river valleys in the west, and thence south and east to Duxbury Beach. The proposal includes the construction of an express parkway for the entire length of the Bay Circuit. This project has been endorsed by the State Planning Board. It will be an ambitious undertaking and can best be carried out section by section. It merits public support because of the great contribution it would make to the permanent park reservation system of our expanding region.

Boston City Hall *Fay Foto Service Inc.*

PUBLIC BUILDINGS

Government District for Boston

Boston has never been able to achieve a single grouping of government office buildings in a civic center. Federal agencies occupy the Custom House and the Post Office Building, with some bureaus in private office buildings. The state government has overflowed from the State House and leases space in many locations. The Public Works Department has its own building on Nashua Street. The Old and New Court Houses of Suffolk County are close to the State House. A majority of the departments of the City of Boston's government are located in the City Hall and City Hall Annex. The Boston Park Department, Traffic Commis-

Public Works Building . . . . This modern structure on Nashua Street overlooks the Charles River. It houses the Department of Public Works of the Commonwealth.

Ewing Galloway, N.Y.

New Court House, Suffolk County . . . . A building that dominates the city. Note typical old Boston houses at left. →

Modern Fire Station in Brookline

sion and School Department are among the more important agencies with their offices in other sections of the city.

When the state and city are able to undertake construction of additional office buildings, it is expected that they will endeavor to obtain a greater degree of centralization. The suggestion has been made that some of the land in the Bowdoin Square — Scollay Square area would be appropriate for this future development. In this way, a more clearly defined "government district," if not a true civic center, could be achieved.[1]

On a smaller scale, the City of Newton gives a good example of a self-contained civic center (see photograph).

Police and Fire Stations

In small cities and towns, the main police and fire stations can often be included in the civic center. Large cities present special location problems because of the need for police and fire service to many separate neighborhoods. Fire stations must be close to a main thoroughfare so that the engines can make good time. Local fire and police stations can frequently be combined in one building. In Greater Boston, the fire departments of separate municipalities have an established system for mutual assistance in answering alarms.

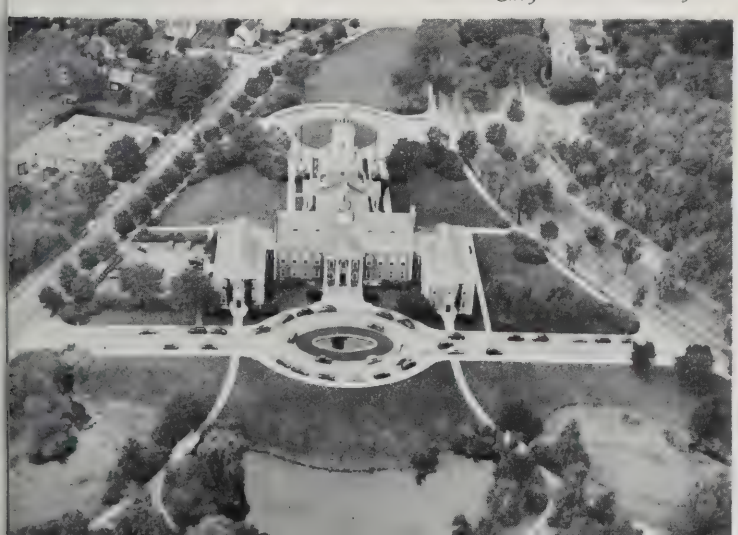
It is good practice to study the entire pattern of police and fire station distribution in a large city; and then to work out a comprehensive plan for replacement of old buildings, based on efficient service to all districts.

Public Libraries

The City of Boston established the first tax-supported public library in the United States. The main library on Copley Square is recognized as the fourth most important in the nation, taking rank after New York, Cleveland and Chicago.

[1] A proposal for a new City Hall was put forward by the Boston City Planning Board in its 1930 Annual Report.

Newton Civic Center . . . City Hall on a well planned site.
Cheyne Aerial Surveys



The Boston Public Library . . . . Copley Square in foreground. Boylston street at right.
Ewing Galloway, N.Y.

Branch libraries are an essential part of the cultural resources of a city. A branch is needed in every neighborhood and should preferably be close to the high school, both to be parts of the local civic center. Besides lending books and supplying facilities for research, branch libraries are entering more and more into the field of specialized community services such as storytelling hours for children, evening study courses for adults, and exhibitions on subjects of current public interest.

Department of School Buildings

Technical High School, Boston . . . . An old building on a very inadequate site.

PUBLIC SCHOOLS

It is desirable that there should be a public grade school near the center of each residential neighborhood. Children should not have to walk farther than a half-mile to their elementary school. Elementary schools of 600 to 1200 pupils are generally considered to be most practical from the standpoint of teaching efficiency, good administration and economy. High schools can be larger as they serve groups of adjacent neighborhoods and can draw their students from distances up to two miles — or much farther if bus service is available. Specialized high schools teaching technical trades usually serve an entire city and should be located where they can easily be reached by rapid transit.

New schools should have very much larger sites than have been provided in the past. Adequate recreation facilities on school land are particularly important when the school is not adjacent to public play space.

In Boston, the school building problem is a particularly difficult one. Many of the existing schools are obsolete and lack proper playground space. There have also been changes in the character and requirements of neighborhoods, due to population shifts.

Brighton High School, Boston

Department of School Buildings

High School of Commerce, Boston — *Department of School Buildings*

Some areas have more public school pupils than ever before; others have less. These problems are being given full consideration by the Boston School Committee.

Recognizing the need for an over-all study of the school system, the Boston Finance Commission had a special survey made in 1944 by Dr. George D. Strayer of Teachers College, Columbia University. Many of his suggestions dealt with matters of administration, teaching methods and financial procedures, which do not come within the scope of this book. With respect to school buildings, Dr. Strayer recommended that 35 old structures be abandoned. The timing for carrying out this proposal will naturally depend upon the number of elementary pupils who enter school in the years immediately ahead of us. There is evidence that the annual number will be much larger, at least for a while, than it was during the years before World War II.

Norwood High School . . . . A well designed building on a spacious site of 13 acres. The capacity of this school is 750 students. *Fred Tobey, Sharon, Mass.*

VIII.

EXPANSION OF REGIONAL GOVERNMENT

Changes in Municipal Boundaries

Between 1630 and 1644, 12 independent towns were established in the Massachusetts Bay Colony:

Boston	Hull
Cambridge	Lynn
Charlestown	Medford
Dedham	Roxbury
Dorchester	Watertown
Hingham	Weymouth

Their boundaries are shown on the adjacent map, together with the dates of their founding, and the names of the municipalities into which they were later divided. There are now 61 cities and towns where once there were only these 12.

Brookline split off from Boston and became a separate town in 1705; Chelsea in 1739. South Boston was added to the city in 1804, and Washington Village in 1855. Both the latter had previously been parts of the Town of Dorchester. It is worthy of note that East Boston is the only suburban district that has always been a part of Boston.

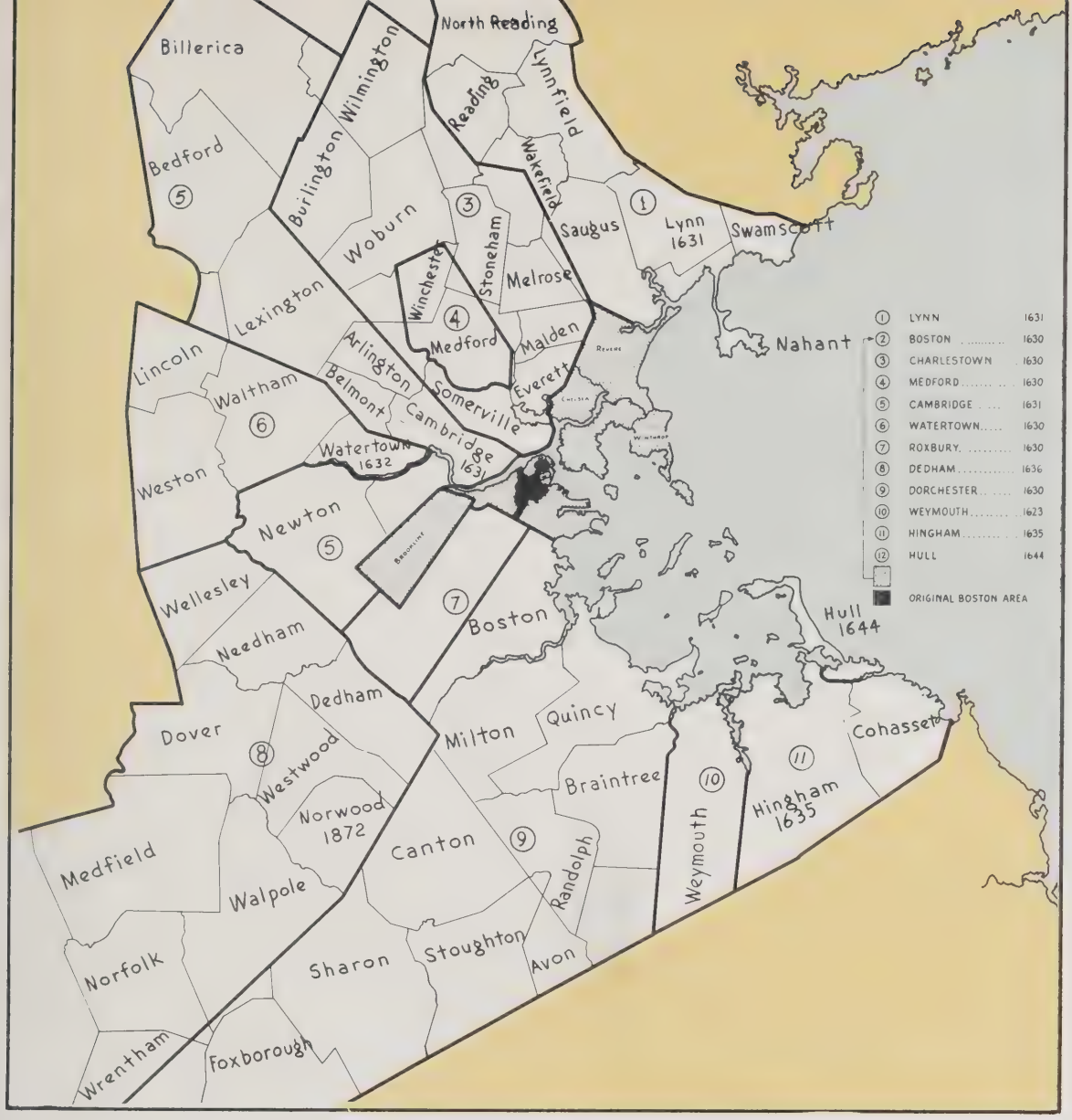
Until the middle of the 19th Century, the towns were very self-contained. Each had its own business center, mills, schools and churches. People had little occasion to travel from one town to another. With the coming of the horse-drawn street cars, the barriers of isolation were broken down. Families moved out into the country, and daily travel between suburbs and city began. The homes of former Boston residents gradually filled up the vacant land in the surrounding towns, and created an insistent need for better public services. The great influx of "city people" also changed the living habits and political ways of life in these towns.

It was only logical that a movement for annexation to Boston should develop. Although agitation had begun as early as 1854, it was not until 1867 that Roxbury became the first entire town to join the City of Boston. By 1874, Dorchester, Charlestown, Brighton and West Roxbury had also voted in favor of annexation. The trend then came to a halt.

Other nearby cities and towns recognized the advantages of a strong centralized government to help them finance the increasing burden of costs for highways, water supply and sewers, but they preferred to retain their political independence. They felt fully capable of governing themselves, and also feared that they might be dominated by the government of the central city.

Since 1874, only one additional town has voted for annexation — Hyde Park, which became a part of Boston in 1912. This last addition to Boston brought the city land area to 44 square miles, as contrasted with the one and one-quarter square miles of the original settlement on the peninsula.

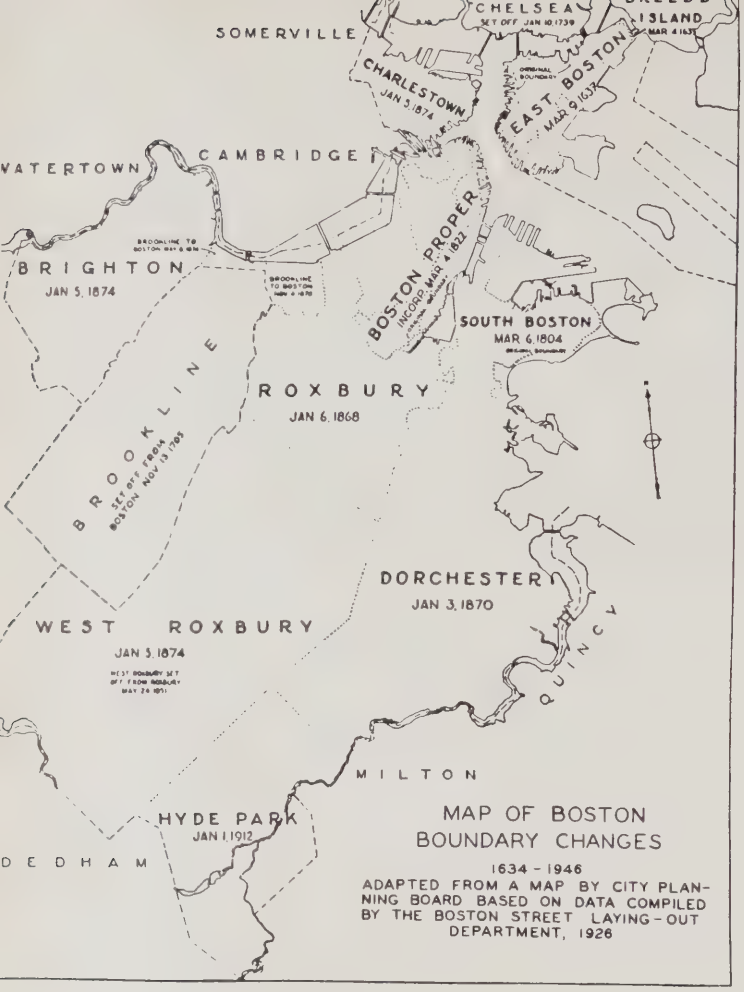
In other urban regions of the United States, the process of annexation was carried much further than in Boston. For ex-



The Twelve Original Towns of the Massachusetts Bay Colony . . . . This map shows the 61 cities and towns of today, which have been carved out of the 12 original towns of 1644.

ample, Philadelphia increased its area from two square miles to 128; Chicago, from four to 205; New York, from 22 to 299; and Los Angeles, from 28 to 459.

Many of the towns near Boston still retain the charm of their early days. With their spacious central greens and well designed buildings, they provide a most attractive environment for living. Their local government has changed little from the town meeting form of the colonial period. With the passing of the years, however, it has been necessary for these towns to band together with neighboring municipalities, in order to meet the need for a larger water supply and for other services that are more efficiently furnished on a regional basis.



The Metropolitan District Commission

The people of the surrounding cities and towns have sought the obvious advantages of regional services, without the possible disadvantages of a consolidated super-city government. Gradually, over a long period of years, they have created a series of metropolitan agencies, which are described in this chapter. These are restricted to particular fields of regional activity, and in considerable measure fulfill the desired objective.

The first step in regional government was the outgrowth of the very serious public health problem that Boston and the surrounding municipalities were facing in the third quarter of the 19th Century. Sewage was polluting the rivers and wells from which drinking water was obtained. To curb the dangers of epidemic disease, it was recognized that there must be an assured supply of pure water and that the sewage must be piped far enough out to sea to be carried away by the tides.

After some years of investigation and study, the Legislature created the Metropolitan Sewer District in 1889. This was followed in 1893 by establishment of the Metropolitan Parks District. The year 1895 saw the formation of the Metropolitan Water District.

Cities and towns near Boston were free to join these special regional government agencies, but were under no compulsion to do so. Their need for the types of service that were provided was so vital, however, that a great many of them agreed to join.

The excellent work performed by these commissions is described in earlier chapters.[1] We are interested here in stressing their political significance as the first agencies in a gradually developing framework of regional government, designed to solve problems that are regional in scope.

In 1901, the Water and Sewer Districts were combined into the Metropolitan Water and Sewerage District, and in 1919 this in

The Quiet Beauty of a New England Town *American Airlines*

[1] Metropolitan Water and Sewerage Systems, pages 165 and 166; and Metropolitan Parks, page 245.

Greater Boston Community Council

NEIGHBORHOODS

1 ABERDEEN
2 ALLSTON
3 ANDREW SQUARE
4 ASHMONT
5 BACK OF BEACON HILL
6 BEACON-COMMONWEALTH AVE.
7 BEACON HILL
8 BELLEVUE-MT. VERNON
9 BRIGHTON CENTER
10 BROOK FARM
11 CASTLE SQ.-NEW YORK STS.
12 CENSUS TRACT B-5A
13 CENSUS TRACT W-6D
14 CENTRAL-MAVERICK SQS.
15 CHARLESTOWN
16 CITY POINT
17 CODMAN SQ. NORTH
18 CODMAN SQ. SOUTH
19 COLUMBUS-MASS. AVES.
20 COMMONWEALTH AVE.
21 DAY SQUARE
22 DORCHESTER LOWER MILLS
23 DUDLEY ST. EAST
24 DUDLEY ST. SOUTH
25 EAGLE HILL
26 EGLESTON SQUARE
27 FANEUIL
28 FENWAY-BROOKLINE AVE.
29 FIELD'S CORNER
30 FRANKLIN FIELD
31 FRANKLIN PARK
32 GROVE HALL EAST
33 GROVE HALL WEST
34 HEATH STREET
35 HUNTINGTON-MASS. AVES.
36 HYDE PARK
37 JAMAICA PLAIN EAST
38 JAMAICA PLAIN WEST
39 JAMAICAWAY-ARBORETUM
40 JEFFRIES POINT
41 LOWER ROXBURY
42 MATTAPAN
43 MISSION HILL
44 MOUNT BOWDOIN
45 MT. HOPE-FOREST HILLS
46 NEPONSET
47 NORTH END
48 NORTH TREMONT
49 OAK SQUARE
50 OLD HARBOR VILLAGE
51 ORIENT HEIGHTS
52 PARKER HILL
53 PARKWAY
54 ROSLINDALE CENTER
55 SAVIN HILL
56 SCUTH BAY
57 SOUTH COVE
58 SOUTH TREMONT
59 TELEGRAPH HILL
60 UPHAM'S CORNER
61 WARREN STREET
62 WEST BROADWAY
63 WEST END PROPER

NEIGHBORHOODS & HEALTH AND WELFARE DISTRICTS IN BOSTON

turn was consolidated with the Parks District to form the present Metropolitan District Commission.

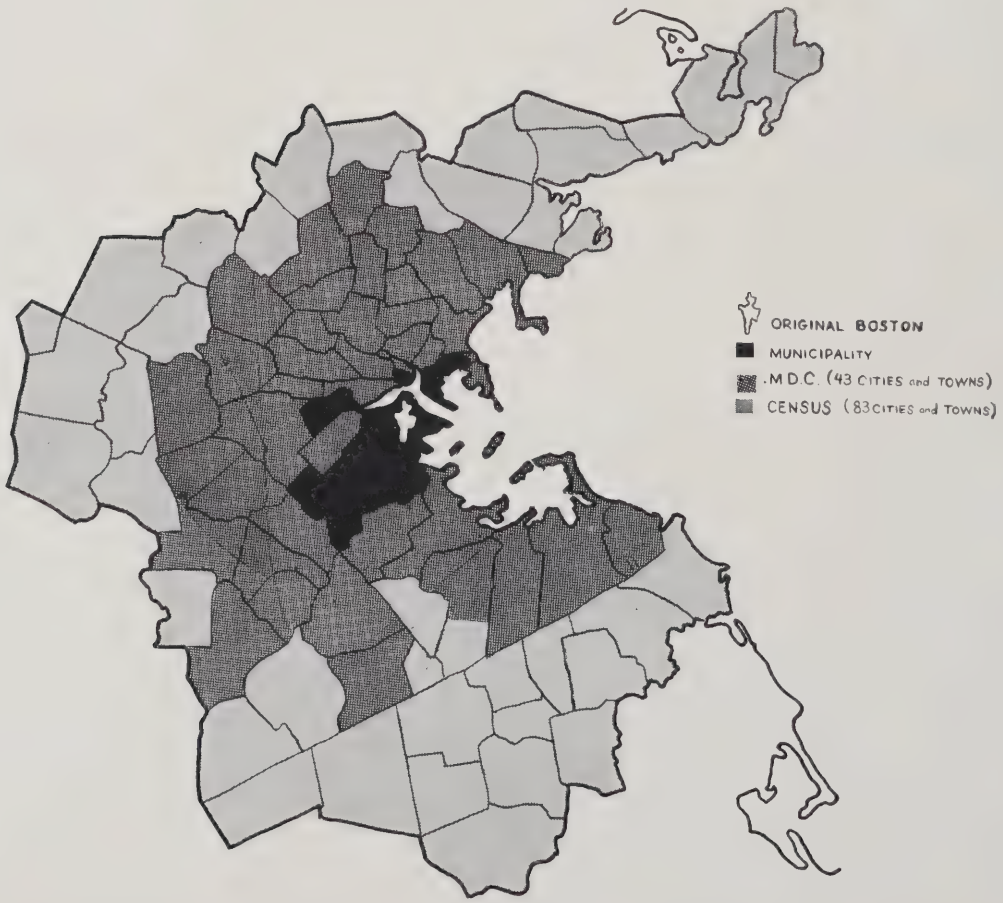
The members of the commission, like those of its predecessors, are not elected by the people. Instead, they are appointed by the Governor, with the consent of the Executive Council. The metropolitan district commissioners actually manage three separate but related districts: sewerage, water, and parks. Of the total of 43 municipalities within the entire Metropolitan District, less than half belong to all three districts and share the costs of all three services. The remainder belong only to one or two of the districts, and pay accordingly. For example, Lexington is part of the Sewerage and Water Districts, but has not joined the Parks District.

The accompanying map is entitled "The Four Bostons," because it shows:

- The original settlement on the peninsula
- The present City of Boston
- The Metropolitan District Commission territory
- The United States Census Metropolitan District (83 cities and towns) [1]

[1] See footnote 3 on page 175

The "Four Bostons" . . . . The original settlement; the present city; the Metropolitan District Commission territory (43 cities and towns); and the U. S. Census Metropolitan District (83 cities and towns).



Separate maps indicate which cities and towns are part of the Sewerage, Water and Parks Districts of the M.D.C.

The membership of the cities and towns in the Metropolitan District may be classified as follows:

	Number of Cities and Towns
Sewerage, Water and Parks	18
Sewerage and Water	1
Sewerage and Parks	10
Water and Parks	3
Sewerage only	4
Water only	0
Parks only	7
Total	43

By combining the above figures, we find that 33 municipalities belong to the Sewerage District; 22 to the Water District; and 38 to the Parks District.

Other Regional Agencies

The creation of the *Metropolitan Transit Authority* in 1947 has been previously discussed.[1] Its territory now embraces 14 cities and towns. In earlier chapters, we have also given a full description of the functions of two other regional agencies: the *Mystic River Bridge Authority;*[2] and the *Port of Boston Authority.*[3]

Proposals for a More Centralized Metropolitan Government

After 1875, it became clear that few if any additional cities and towns would vote in favor of annexation to Boston. At various times since then, proposals have been advanced for the creation of a strong central government for the entire region. The earlier recommendations looked toward a single consolidated super-city government to be established by authority of the Legislature, with its municipal legislative body elected by the people of the whole area. Later proposals would have retained the individual local governments of the existing cities and towns, but would have created a separate elected metropolitan council to administer regional matters.

A recent proposal of this latter type merits attention. In 1944 the Boston Society of Architects, the Boston Chamber of Commerce, Harvard University, Boston University and Massachusetts Institute of Technology sponsored "The Boston Contest" to seek solutions for the problems of the metropolitan area.[4] Among the 90 programs entered in the contest, the one submitted by a Harvard group under the chairmanship of Professor Carl J. Friedrich was awarded first prize.

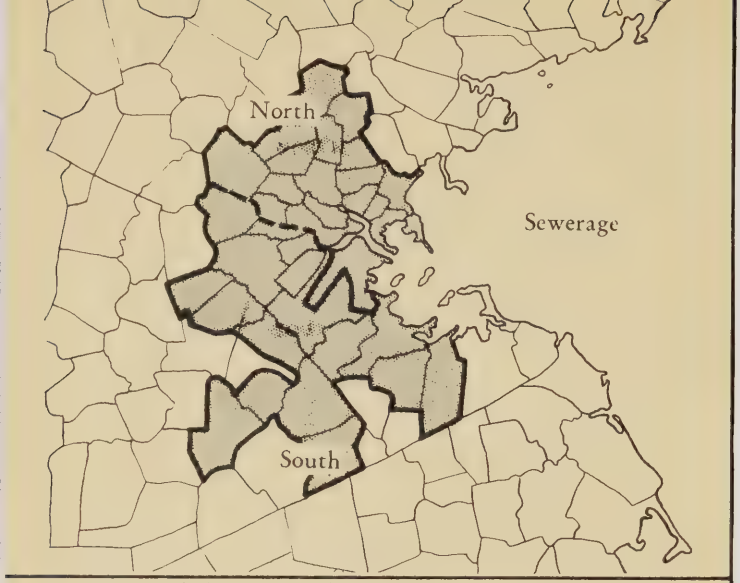
The winning program proposed the organization of an elected metropolitan authority to take over all the water and sewerage and park systems of the Metropolitan District Commission; and also to exercise regional jurisdiction over rapid transit, fire and police departments, health and sanitation services and public welfare. In the field of education, the group suggested that vocational training, adult education programs and educational research might well become services to be rendered under the metropolitan authority in close cooperation with the state and local units. (Primary schools and high schools would remain as at present, under the local boards of education.) The preparation of a master plan for the entire region would become the responsibility of the new metropolitan authority. In all other matters not listed above, cities and towns would retain their present jurisdiction and powers. With fewer functions to perform, local governments

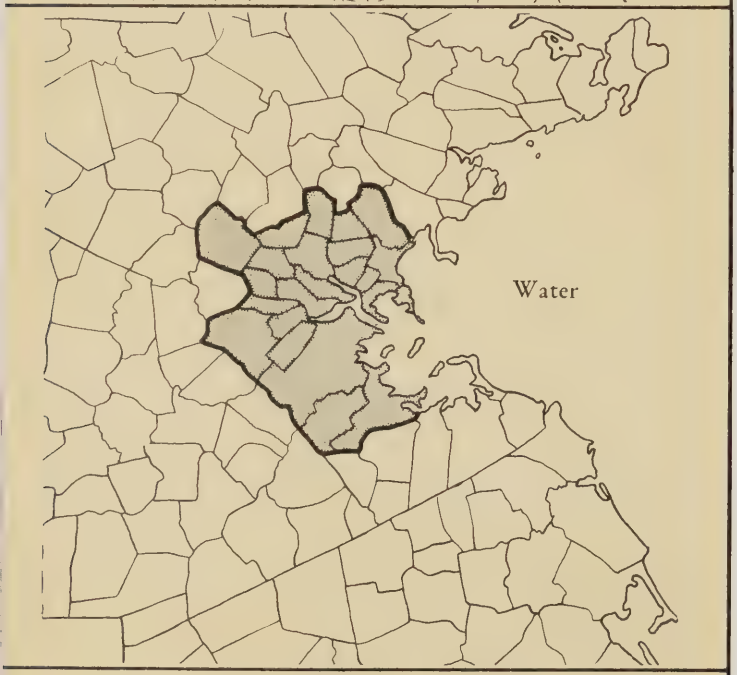
[1] See page 205.

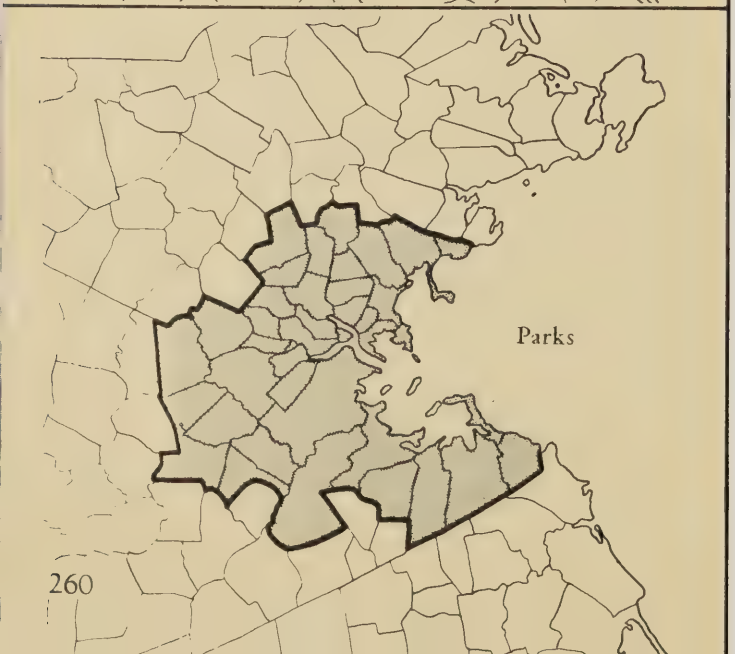
[2] See page 200

[3] See page 219 ff.

[4] The Boston Contest, published by Boston University, 1945.







could expect to achieve some reductions in operating costs.

Current Trends in Metropolitan Government

All the metropolitan agencies now in existence have one important characteristic in common: the officials who administer their affairs are *appointed* by the Governor — not elected by the voters. Every serious proposal for a change in the form of our metropolitan agencies, from 1889 when the original Metropolitan Sewerage District was established down through 1947, has been directed fundamentally toward the substitution of elected officials for appointed officials. The question as to which is the better system has never been finally settled. It may be expected that it will be raised again.

The recent trend in the Boston region is clearly toward the creation of additional *appointed* metropolitan agencies, each with specified regional powers to build and operate some particular type of improvement, such as port facilities or transit. In 1948, the Legislature established another agency of this kind—the State Airport Management Board, for Logan and Bedford airports. A Boston Market Authority has also been proposed.

Bearing in mind the consolidation of water supplies, sewerage systems and regional parks under a single Metropolitan District Commission, it seems logical that further combinations might be made in the future. The very multiplicity of metropolitan agencies would seem to lead to consolidations, as the easiest means of simplifying the framework of government. This is particularly true if the separate functions to be combined are closely re-

The Metropolitan District Commission . . . . Sewerage, Water and Park Districts.

lated to one another. There is a recent precedent for this type of consolidation in New York City, where several separate bridge authorities, parkway authorities and a tunnel authority were all gradually merged into one agency, known as the Triborough Bridge and Tunnel Authority. The successive consolidations took place after most of the agencies involved had completed the construction projects that they were originally authorized to build.

It is also logical that some existing regional agencies might be given additional powers, as an alternative to creating new and separate agencies. An example of this technique is the enlargement of the powers of the Port of New York Authority in 1947, so as to include the ownership, construction and operation of regional airports.

Regardless of the details of future procedure, experience has proved that creating special metropolitan agencies is an excellent method for dealing with difficult metropolitan problems — a method that does not infringe upon the appropriate powers of the separate city and town governments.

The Responsibility for Metropolitan Planning

In Massachusetts, legislative recess commissions are regularly created to analyze both state-wide and metropolitan problems and report their recommendations to the Legislature. These commissions are generally composed of senators and representatives, and frequently include appointed officials, such as the commissioner of the State Department of Public Works and the chairman of the State Planning Board. It is the policy of these recess commissions to draw upon the advice of state and local officials whose work is related to the problem at hand. An example in point is the Post-War Highway Commission, originally created in 1943, which set up an advisory committee of engineers drawn from six technical agencies of the state and the City of Boston.

It has long been recognized that there is a definite need for comprehensive regional planning of major physical improvements for the *entire* metropolitan area as one operation. This would supplement the detailed local plans of the separate municipalities. With this purpose in view, a Division of Metropolitan Planning was established in 1923 as a part of the Metropolitan District Commission. In 1941, the powers, duties and personnel of this division were transferred to the State Planning Board.

The tendency in recent years has been to place increasing responsibility upon the State Planning Board in all matters pertaining to comprehensive planning for the Boston region. This is considered sound policy and much preferable to the creation of a new metropolitan planning board. It is also more advantageous than expanding the planning functions of separate and unrelated departments of government. The need is for further consolidation of the regional planning process, with the State Planning Board acting as the principal planning agency and as the coordinator of such technical planning as must necessarily be carried on by specialists in other departments, or by private consulting engineers.[1] It is desirable to stress the difference between *planning* on the one hand, and *construction* on the other. Regional planning can be highly centralized to good advantage under the State Planning Board. Construction can continue to be performed by separate agencies.

[1] Planning for local improvements would continue to be the function of the city and town planning boards.

IX.

LEGAL TOOLS FOR PLANNING AND ACTION

Town and City Planning Boards

Chapter X of Part I has described the general types of state and local laws that are prevalent in the United States as a foundation for the preparation and carrying out of city and regional plans. This chapter discusses principal provisions of the Massachusetts laws related to planning, zoning and housing.

There is a long history of planning legislation in Massachusetts, dating back to 1891 when the City of Boston was first authorized by the Legislature to establish a "Board of Survey" to pass upon the layout of new streets in real estate subdivisions. Provision for town boards of survey was made in 1907. In 1913, a law was passed requiring all cities, and all towns of over 10,000 population, to establish planning boards, which were given very general powers to study "the resources, possibilities and needs of the city or town . . . . and to make plans for the needs of the municipality." The next year, towns of less than 10,000 population were permitted to create planning boards, if they wished to do so.

Legislation in 1936 provided for a new type of planning board for cities and towns, with more detailed and specific powers. This law was amended and clarified during the 1947 legislative session (Chapter 340 of 1947). It is very adequate legislation, comparing favorably with the laws of other states. Every one of the 43 cities and towns in the Greater Boston Metropolitan District has a functioning planning board, established under one or another of the state laws mentioned above.

Very briefly stated, the duties of the new type planning boards, established under the 1936 or 1947 acts, are to pass upon subdivision layouts; to undertake studies of town or city needs; to prepare recommendations and plans with estimated costs; and to make a master plan.

The following municipalities in the Boston region have filed comprehensive master plans, or substantial parts thereof, at the offices of the State Planning Board:

Arlington	Norwood
Boston	Salem
Cambridge	Sharon
Concord	Wakefield
Dedham	Walpole
Malden	Watertown
Melrose	Wellesley
Newton	Winchester

The master plans of some of the above cities and towns were prepared a number of years ago, and are now in need of revision. Canton, Milton, Lincoln, Reading, Swampscott, Wellesley, and a few other towns not listed above have particularly active planning boards. They have made much progress in planning studies, but have not yet prepared comprehensive master plans.

Unfortunately, many planning boards throughout the state do not have sufficient budget funds. All too often, they cannot pay the cost of making a master plan. This cost would not be high. Why are not suffi-

cient funds appropriated for such necessary work? One of the main reasons is because many people in these communities do not yet appreciate that planning for the future is a vital public service requiring an adequately financed planning board. The citizens and their officials can hardly be blamed for not favoring proper appropriations for planning, if they do not understand that planning is essential for guiding the growth of the municipality. There is a very urgent need for developing a greater degree of understanding.

Boston City Planning Board

The Boston City Planning Board was created by the City Council in 1914. It has somewhat indefinite but quite broad powers, including the task of preparing a comprehensive master plan. Control of new street layouts is exercised by the Street Layout Department under the Board of Street Commissioners.

Fay Foto Service Inc.

The Old State House . . . . Note the Lion and the Unicorn — symbols of the British crown. The Declaration of Independence was read from the balcony in 1776.

In 1940, an ordinance was adopted, increasing the number of members of the planning board and stipulating specific qualifications for their selection. The planing board now consists of nine members serving, as is customary, without pay. Its work has been greatly restricted because its annual budget is small. However, a good deal of progress has been made toward a master plan for the entire city. As long ago as 1930, a very comprehensive master highway plan was prepared and published (the Whitten Report). Many street improvements recommended in that plan have been carried out, and many projects that are expected to be built in the future are parts of the 1930 plan.

A most important function of the board has been the preparation of special reports on problems referred to it by the City Council for investigation and study. It has undertaken detailed surveys of neighborhood playground requirements; and has analyzed social and economic conditions in some of the poorest residential areas of the city. In 1947 it made a special study of the need for union terminals for large trucks. In 1948, it was preparing a report on Boston's playground deficiencies. The board also makes recommendations from time to time for amendments to the zoning regulations and zoning map.

Massachusetts State Planning Board

In 1935, the Legislature created the State Planning Board, with a membership composed of the heads of the state departments of Public Works, Public Health, Conservation, and of the Metropolitan District Com-

mission, and six others appointed by the Governor with the advice and consent of the Executive Council. The board is directly responsible to the Governor and council. Many of its recommendations are discussed in other chapters of this volume.

It is the duty of the board to prepare a master plan for the state and to report on a wide variety of matters that may be referred to it. The board undertakes continuing studies of such subjects as rural land uses; water resources; flood control; industrial activity; park and recreational facilities; and highway, transit and airport requirements. It assists city and town planning boards with their local problems. The board is also the official agency of the Commonwealth for dealing with other states on the development and improvement of natural waterways that affect Massachusetts.

Because of the detailed nature of its responsibilities, the State Planning Board is in a position to make regional plans for parts of the state, as well as state-wide plans. The state board is effective and farseeing in its work and prepares many reports each year, giving the results of its special studies. Its official publication, "A Planning Forum," discusses matters of technical and timely interest.

Subdivision Control

The role of planning boards in controlling the subdivision of land into streets and building lots has been explained earlier.[1] Massachusetts can congratulate itself on its 1947 planning law, which gives these boards extensive and detailed powers in subdivision control.

[1] See page 142.

Fay Foto Service Inc.

The State House . . . . This beautiful building was designed by Charles Bulfinch. The cornerstone was laid in 1795. New wings and other additions have been built from time to time.

Most planning boards, fortunately, have been conscientious and wise in the application of these powers. It is well to repeat that the subdivider may be required by the board to construct streets, install water mains and other utilities, and to provide a "park or parks suitably located for playground or recreation purposes." These provisions are important and have often been neglected in the Boston region. The mistake of not setting aside land for small parks is always expensive and sometimes impossible to correct after lots are sold and houses built.

Zoning

State Laws: Boston's pioneer zoning laws of 1892 and 1904 regulated only the height of buildings. It was not until 1920 that the Legislature authorized cities and towns throughout the State to adopt zoning ordinances controlling the use of buildings, the size of lots and the density of population, as well as building heights. The delay was due in part to the need for amending the Constitution of the Commonwealth.

City of Boston: The City of Boston's zoning regulations, prepared by the City Planning Board, were not adopted as a local law by the City Council, but instead were enacted by the State Legislature. This was done in 1924. A revision of the law became effective in 1943, but some important additional changes should be made to bring Boston's zoning up to the best modern standards. For example, large vacant areas are now zoned for two-family houses. There is need for changing the zoning of some of these areas so as to encourage construction of the more modern single family row houses; or alternatively, to allow two-story apartment houses. In changing the zoning, care must be taken not to permit the building of any more "three-decker" flats (see illustration on page 181) as this type of dwelling is now obsolete. The choice between row houses and two-story apartments would depend on the location.

Another modern trend is to concentrate neighborhood stores in compact local business centers. The Boston zoning map is laid out to permit stores at any location along many of the important streets. (See regional map of principal areas zoned for business.) As entire street frontages are rarely needed for business, except in downtown centers, this so-called "ribbon zoning" has resulted in scattered business development with residences intermixed with stores. Thorough revision of the zoning map needs to be undertaken to achieve a more orderly arrangement and distribution of residential, business and industrial districts, without excessive business frontage. In this way, the past mistake of jumbled land uses can be

Bronx-Whitestone Bridge, New York City . . . . This bridge connects The Bronx and Queens. The span length between towers is 2300 feet.

prevented in future building operations. This need is fully recognized by the City Planning Board, but it has not had sufficient funds to make the necessary studies.

The Boston zoning regulations also should be modernized so as to require off-street parking spaces and truck loading bays. These are necessary because of the heavy volumes of passenger and commercial traffic created by large new buildings such as department stores, hotels, theaters, and warehouses.

Cities and Towns in the Environs of Boston: As each city or town has a zoning ordinance and zoning map separate and distinct from those of adjacent municipalities, it is understandable that there should be wide differences in their provisions governing permitted land uses, required sizes of lots, dimensions of yards etc. Many of these differences arise from the fact that the various ordinances were written at different times over a long period of years, so that some represent modern practice while others are out-of-date. A greater similarity and consistency would be desirable. The situation obviously indicates the need for extensive revisions of the older ordinances, coupled with close cooperation between the zoning officials of municipalities having similar problems and needs.

In rural areas along main highways it is particularly undesirable to permit gasoline stations and lunch stands to be constructed at random. They should be built only in small well-situated business zones, usually at crossroads. The remainder of the highway frontage can be protected by zoning it for residential and agricultural use. At the present time, as in Boston, there is too much "ribbon zoning" for business in the surrounding cities and towns (see map).[1]

[1] See page 242.

Building Codes

The present Boston building code was adopted by the City Council in 1943. It is so closely related to the zoning ordinance that arrangements were made by the State Legislature for the two to become effective at the same time.

Almost all the cities and towns in the Metropolitan District now have their own local building codes. As in the case of zoning ordinances, it would be better if there were a greater degree of uniformity among the codes of adjacent municipalities. There is no good reason why a wooden house — or a brick apartment house — should have to be designed differently in different towns. The history of such cases usually reveals that after one town prepared its building code, the second town used the first code as a model and then decided to improve upon it. The first town did not bother to adopt the improvements so the two towns continue side by side, operating under similar but different laws. Steps are being taken by the State Legislature to achieve some degree of uniformity by fixing minimum standards for safety of buildings, which would be made applicable to all construction throughout the Commonwealth.

Another significant measure along these lines was adopted by the Massachusetts Legislature in 1947. This provided a new procedure for legalizing new materials and methods of construction — adequate as to strength and safety — without making it necessary for each separate municipality to amend its own local building code.

Housing Laws

There are many Massachusetts laws designed to encourage the construction of large housing developments financed by pri-

vate corporations, including banks and insurance companies. The Limited Dividend Corporation Law of 1933 and the Urban Redevelopment Corporation Law of 1945 both give the land developer certain advantages such as partial exemption from real estate taxes, and the power to acquire land by methods usually reserved to governments. In return, the laws fix a maximum dividend rate that the corporation can pay to its stockholders. The 1933 law is now out-of-date; but it may be expected that the 1945 law, with recent amendments, will result in construction of some large developments on vacant land. Rebuilding operations in old decayed neighborhoods may also follow.

In 1946, the Legislature authorized cities and towns to construct new houses with public funds, to be rented to veterans. This Veterans Housing Act resulted from state-wide recognition that private companies cannot build at rents which the majority of veterans can afford. The law was made more liberal in 1947. All homes that the cities and towns build must be sold when the housing emergency is over. To encourage building, the Commonwealth agreed to repay part of any financial losses that the municipalities may incur when they sell the houses.

The 1948 session of the Legislature passed a law permitting the State's credit to be used by municipal housing authorities for up to $200,000,000 of housing for low income veterans. In order to secure reasonably low rents, the Commonwealth will pay an annual subsidy of two and one-half per cent of the cost of these housing developments. It is estimated that this 1948 law can finance as many as 20,000 homes, but the actual number constructed will depend upon the extent to which the municipal housing authorities decide to participate in the program.

Fay Foto Service Inc.

Boston and the Charles River Basin . . . . Longfellow Bridge at left; boat basin in foreground.

X.

SUMMARY OF PLANS AND PROPOSALS FOR GREATER BOSTON'S FUTURE

The Emerging Master Plan

The people need to understand the region's plans and proposals for physical improvements. They should also know who is sponsoring them. Legislative committees, the state and local planning boards, and other government agencies devote a great deal of time to preparing these plans. They also analyze suggestions made by individuals and private groups of citizens.

In this book we have called attention to many of the important improvements that have been carried out in the past — improvements that reflect great credit on the people of the City of Boston, of the surrounding cities and towns, and of the Commonwealth. The physical framework for our way of life is basically sound, and makes this Greater Boston area a good place to live. Nevertheless, many things remain to be done.

In various chapters of Part II, the most urgent problems are described. We have gone into considerable detail to explain the plans that have already been made for meeting these problems. Some plans are regional in scope; others deal with purely local conditions. The regional plans and proposals, taken together, constitute the framework for an emerging *master plan* for the entire metropolitan area. Into this framework fit the many local plans of the separate cities and towns. The over-all framework has not yet been completed, nor has all the necessary local planning been accomplished. However, great progress has been made, particularly in the past few years. The gaps that remain will be filled in as the responsible state and local agencies proceed with their work. Meantime, there is a challenge to all of us to see that necessary steps are taken to carry out the plans already completed and agreed upon.

Let us summarize the parts of the master plan that now are ready for action, and list with them the major problems and needs for which plans have not yet been made.

Housing

1. More houses and apartments are needed for the poor as well as for the rich. Steps have been taken to solve this critical housing shortage. These embrace (a) an enlarged and speeded-up program of private building; and (b) state and municipal participation in public housing construction for middle and low income veterans' families. The extent of the housing demand has already been determined, and it is anticipated that a few years of concerted activity will solve this problem.
2. Outworn residential neighborhoods should be torn down and redeveloped as soon as the housing shortage permits. The Boston City Planning Board has prepared a plan showing the areas that are most in need of redevelopment. Certain districts have been studied in

Thomas Worcester, Inc.

New Housing in Waltham . . . . A private development of modern row houses.

great detail. Some communities outside Boston have made similar surveys. Financial procedures for redevelopment remain to be worked out. Much will depend upon the future extent of federal and state assistance — both to private developers and to public housing authorities.

Traffic and Parking

1. The master highway plan for the Boston metropolitan area was completed early in 1948. It was prepared by a Joint Board appointed by the Governor of the Commonwealth. The plan includes a system of radial express highways of modern design for both passenger and commercial traffic. These radials lead out from Boston and connect with existing state roads. They all start from an Inner Belt Route — a circumferential express highway

Joint Board for the Metropolitan Master Highway Plan

An Express Highway

Metropolitan District Commission

Old Colony Parkway . . . . Note yacht basin at left.

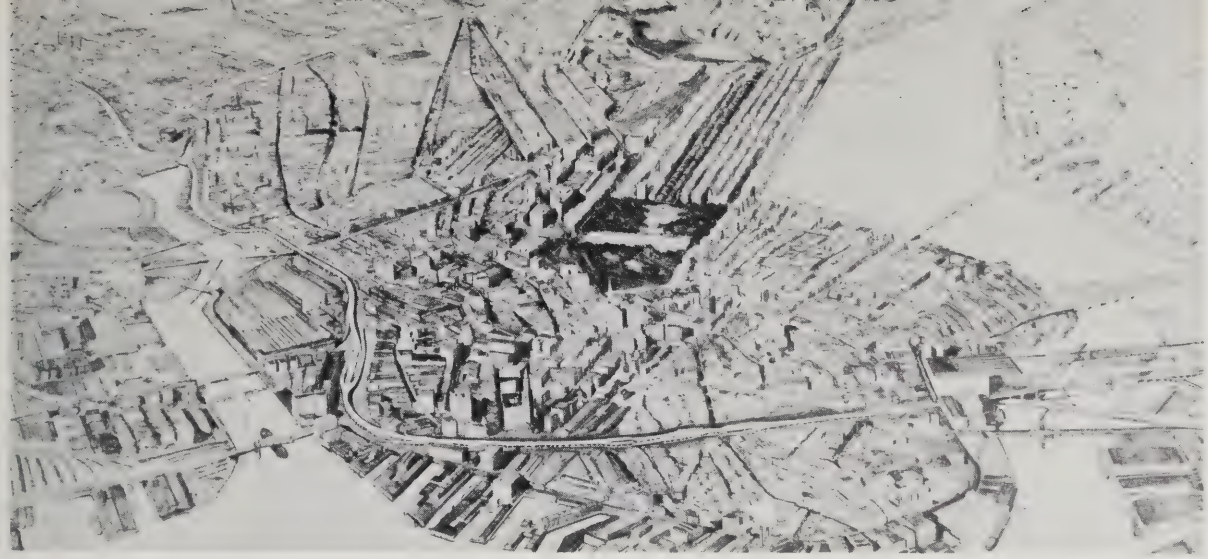
Fay Foto Service Inc.

Newburyport Turnpike . . . . A divided six lane semi-express highway.

linking them together and surrounding the core of the region. At about 12 miles from the center, they are again connected by an outer circumferential express highway (Route 128). The master plan provides for necessary new bridges and a second vehicular tunnel to East Boston, paralleling the Sumner Tunnel.

Carrying out the Master Highway plan will take at least 10 years. Construction should be pushed as fast as finances permit.

2. Plans have been completed and actual construction started on modern express highway connections from the East Boston portal of the Sumner Tunnel to Logan Airport and northward to join the McClellan Highway.
3. Filling in of the South Bay and Fort Point Channel would eliminate the movable bridges that now span these waterways. This project would create new land for many uses, including automobile parking, industrial development and improved highways. Sketch plans have been prepared. Further action awaits official authorization and determination of methods of financing.
4. Union motor truck terminals have been proposed by the Boston City Planning Board after a thorough analysis of the trucking problem as it relates to traffic congestion. Authorization for construction of these terminals must be obtained from the State Legislature.
5. Off-street parking facilities have been the subject of plans and action. As the first major step to solve its parking problem, the City of Boston is investing $5,000,000 to establish such facilities.
6. Parking meters have been installed by Boston and other cities and towns to help enforce reasonable time limits for curb parking. More are needed.
7. Rigid enforcement of parking regulations should be given greater attention when more off-street space is available. Parking surveys are needed as a basis for revision of these regulations.



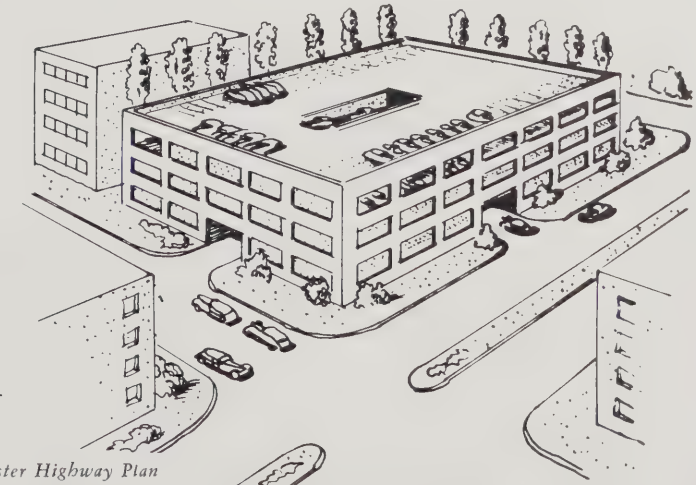
Perspective View of the Belt Route. *Joint Board for the Metropolitan Master Highway Plan*

Transit

1. The master plan for rapid transit was completed in 1947 by a special legislative commission. The plan provides for extensions to the high speed trolley, subway and elevated lines, generally utilizing the tracks of steam commuting railroads. Service would eventually be provided to 12 cities and towns that are not now in the Metropolitan Transit Authority's area. This plan has been referred to the M.T.A.
2. The extension of the rapid transit line from Maverick Square in East Boston to Orient Heights had previously been authorized by the 1946 Legislature. Plans have been drawn and construction work is under way.
3. Provision of two additional tracks from Park Street to Scollay Square and the reconstruction of the Boylston, Park Street and Scollay stations were authorized by the Legislature in 1948.
4. The 1948 Legislature also provided for the removal of a long section of the Washington Street El, by directing the construction of a parallel subway extending the present Washington Street Tunnel to a point near Cedar Street, Roxbury.

Port

A program for construction of new piers has been launched by the Port of Boston Authority. The new Hoosac terminal is under construction. Plans for Mystic, Boston and Albany, and Castle Island Terminals are in preparation. Funds have been made available by the Legislature for a great deal of this program. Installation of modern cargo handling facilities will be a part of each project. Some improvements are needed in streets that lead to the different terminals.



A Parking Garage

Joint Board for the Metropolitan Master Highway Plan

Dwight Davis Studios

Tufts College, Medford . . . Proposed new War Memorial wing of the Eaton Memorial Library.

Airports

1. Plans for completing Logan Airport have been made. Construction is in progress but additional financing will be needed. This airport will have an eventual area of 2000 acres, making it one of the largest on the eastern seaboard.
2. Bedford Airport would become the principal auxiliary commercial field under present plans.
3. Twenty-three additional landing fields are required for private flying. The State Planning Board's Airport Program for Massachusetts Bay and Environs indicates tentative locations for these. No definite steps have been taken to acquire sites.

Business and Industry

1. Boston's market district has been carefully studied by the City Planning Board and also by various groups of private citizens. Sketch plans have been made for replacing the old buildings with modern structures.
2. Development of a South Bay Industrial District would provide modern plants and facilities, particularly for light industries. Preliminary plans indicate that this project would be practical. Achieving it will depend on the availability of railroad-owned land and on securing capital to finance construction.
3. Replacement of blocks of obsolete business buildings is a long-term objective. It can only be realized gradually. Modern architectural and engineering design will assure far more efficient office and store space than we have today. Planning for new business blocks rests largely in the hands of private enterprise. Municipalities may be expected to cooperate by agreeing to close unimportant minor streets.

Parks and Playgrounds

1. Many more small quiet parks, playgrounds and play fields are needed to serve residential neighborhoods throughout the region. These park and play areas must be of adequate size and scientifically located and equipped. Some cities and towns have studied their recreation problem and have made plans for meeting their requirements. Much remains to be accomplished.
2. The Bay Circuit of parks around the outer rim of the region has been recommended by the Trustees of Public Reservations and endorsed by the State Planning Board. No action has been taken to carry out this proposal.

Public Buildings

1. Additional government office buildings are needed for the state and City of Boston. They should be located near each other in the "government center" area as recommended in preliminary plans of the City Planning Board.
2. Long-range programs for school building construction should be prepared for Boston and the principal cities and towns. Large sites are essential so that all new buildings will have ample playgrounds and athletic fields.

Sewage Treatment Plants

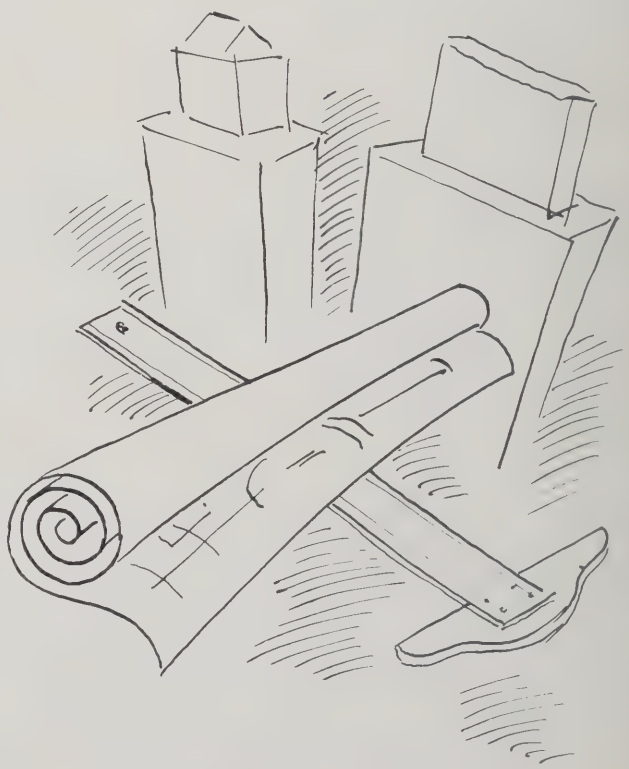
The M.D.C. is constructing a sewage treatment plant on Nut Island. Preliminary plans are being prepared for a second M.D.C. plant on Moon Island. The City of Boston proposes to build a plant on Deer Island. These three plants will solve the problem of harbor pollution and protect our bathing beaches and shellfish industry.

Radcliffe College, Cambridge . . . . New dormitory, to be completed in 1949.

The Lamont Library, Harvard . . . . This is a new library for undergraduate students.

Regional Planning and Administration

1. Completion of a unified master plan for Greater Boston covering all improvements of regional character and scope is most important. It is suggested that responsibility for this plan be centralized in the State Planning Board.
2. Preparation of comprehensive local master plans should be undertaken by cities and towns that have not yet been able to complete this essential task. Some existing master plans are now out-of-date and need to be revised. All the municipalities in the Boston Metropolitan District have official planning boards. A great many of them require larger budget funds to increase their effectiveness.
3. Careful revision of city and town zoning ordinances is necessary to bring them up-to-date; to modify provisions that are inconsistent with the ordi-



nances of adjoining municipalities; and to reduce excessive business zoning along main thoroughfares. Practically all municipalities in the Boston region now have zoning ordinances.

4. Streamlining of the agencies of metropolitan government could be achieved by a series of consolidations, or by extending the powers of some existing agencies. This would be a continuation of an established trend and may come about as a gradual process of evolution. These procedures are believed more efficient, in the long run, than creating a great many permanent additional authorities and commissions, each in charge of a separate activity.

The progress that has been made is evident from this description of plans and requirements. In the next chapter we discuss the part that the citizen can play in translating plans into action.

New Dormitory, Massachusetts Institute of Technology . . . . This interesting building faces the Charles River Basin and is designed to have as many rooms as possible with a view of the water. Alvar Aalto is the architect.

XI.

THE CITIZEN'S RESPONSIBILITY FOR THE FUTURE

Citizen Interest and Understanding

Every citizen — and that includes every boy and girl — should examine Boston and the surrounding cities and towns very carefully. Our environment should not be taken for granted as something that is inevitable. It can be changed for the better, or it might be changed for the worse. The citizens should therefore look with wide open eyes so as to see what is good and what is bad. They must learn to judge the region's advantages and shortcomings, and be able to weigh the merits of proposals for bettering present conditions.

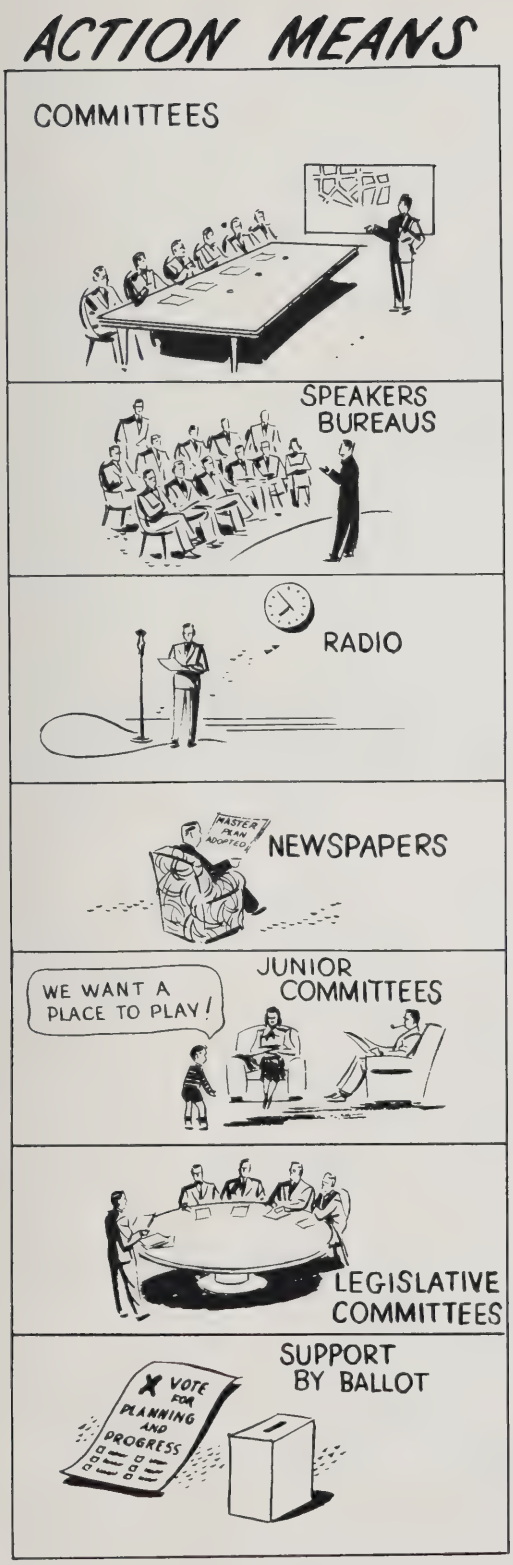
If you, as a good citizen, are concerned about a playground problem, or a traffic problem, or a housing problem, you will usually find that the members of your planning board share your concern; that they may be making plans to solve the problem; and that they need *your* help — the help of all enterprising citizens — to get those plans carried out. By taking an active interest in the work of your planning board, you will also discover that it has other plans that deserve your understanding and support.

It is important that we look forward eagerly toward the future. If all of us are well-informed and alert, if we are willing to devote time and energy to civic affairs and are determined to build for better years to come, then there is no problem that cannot be solved.

Organizing for Citizen Action

When you, the citizen, know the principal problems of the Boston region — especially of your own city or town — and when you understand the plans and proposals for solving these problems, you are then in a position to work with others on a program of enlisting wide popular support to get action. That is the essence of democracy. A good highway plan, for example, is only the first step in the right direction. Laws may need to be passed and money appropriated by a legislative body before construction can start on any of the highways shown on the plan. Strong and united citizen support is the force that gets things done. What kind of organized activity is indicated? Let us describe the various ways in which effective results can be secured.

Statue of Paul Revere . . . . Great leader in civic affairs. The famous Old North Church is in background. *Fay Foto Service Inc.*



Organizing for Civic Action

Committees for Action: In order to multiply the number of responsible citizens who understand our problems and solutions, it is necessary for the leaders of the various communities to form committees of their friends and business associates. These "committees for action," as they might be called, are needed in every city and town that is affected. If the problem is region-wide, there should be a regional committee as well as the local ones. All these committees should keep in close touch with one another through their secretaries. Bulletins should be sent to the members, giving the latest facts and arguments. It should be emphasized that these committees should not attempt to tackle too many problems at one time.

Speakers' Bureaus: Each committee should choose its best public speakers, and arrange for them to address meetings of civic, political, service and church groups. To stimulate maximum support, *every* organization should be addressed by an effective speaker who knows his subject thoroughly and is prepared to answer questions. If the issue at stake is controversial, informal debates can be sheduled.

Public Relations Committees: Under each main committee, there should be a public relations committee, with members who can work with the newspapers on news releases and feature stories, and arrange for interviews with prominent citizens. The chairman of the public relations committee can draw on the speakers' bureau for people to talk on radio programs. Round table and forum discussions are particularly effective on the radio.

Legislative Committees: The members of state and local legislative bodies have a very heavy burden of responsibility in public

Fay Foto Service Inc.

Faneuil Hall . . . . Traditional place of assembly to discuss questions of civic interest. The ground floor is a public market.

American Airlines Inc.

Bunker Hill Monument, Charlestown

issues. They must vote *aye* or *nay* on a great many bills that are related to carrying out public improvements. They are elected after political campaigns, which may involve debating the pros and cons of these improvements. At all times, they need to know the views of their constituents. It is therefore an important part of the work of a committee for action to keep in touch with the legislators, councilmen or selectmen who represent their community, and to appeal for their support of legislation that bears the stamp of popular approval.

Junior Committees: Students in the high schools should form junior committees to study community problems and to support proposals for their solution. Young people frequently have more firsthand knowledge and better understanding of certain problems than their parents. The need for larger and better equipped playgrounds is a typical example. Students who have given thought and study to the playground problem can discuss it at home and enlist their fathers and mothers in a campaign for better play facilities. The same procedure applies equally to many other problems.

Support of Candidates for Public Office: When candidates are campaigning for election, it is proper for the committee for action to get in touch with them and obtain definite expressions of their views on specific public improvements. The members of the committee can urge the election of those candidates who pledge themselves to foster legislation that will carry out these improvements. Candidates welcome responsible support which reflects the expressed desires of the people.

Arthur Griffin

Lexington Green . . . . The children are reading the famous words that Captain Parker addressed to his Minute Men on April 19, 1775:

"Stand your ground
Don't fire unless fired upon
But if they mean to have a war
Let it begin here."

Importance of Continuous Effort

Many good plans for needed public improvements have never been carried out due to lack of public support. Many other plans have been only partially carried out because the public that once supported them was willing to work only for a short while, and then lost interest. The moral is clear. Working for civic needs is not a one month's job, nor even a one year's job. It demands many years of devotion to the cause of the public service. There is much to be done to make the Greater Boston region as good a place in which to live, to work, and to play as it should and can be. It will take decades to build the needed new improvements, and to rebuild our old neighborhoods for new generations of Americans.

Our committees for action must have driving force and perseverance. They must keep our people determined to pursue the desired objectives to the end. The task is a hard one, but the reward will be a greater and finer metropolis taking shape before our eyes.

"Public sentiment is everything. With public sentiment nothing can fail. Without it, nothing can succeed. Consequently, he who molds public sentiment goes deeper than he who enacts statutes or pronounces decisions. He makes statutes and decisions possible or impossible to effectuate."

Abraham Lincoln

BIBLIOGRAPHY

GENERAL WORKS

Books

AMERICAN PLANNING: PAST, PRESENT AND FUTURE — By Cleveland Rodgers. Harper & Brothers, New York. 1947. 290 pp.

CITIES ARE FOR PEOPLE — By Mel Scott. Pacific Southwest Academy, Los Angeles, California. 1942. 110 pp.

CITY DEVELOPMENT: STUDIES IN DISINTEGRATION AND RENEWAL — By Lewis Mumford. Harcourt, Brace and Co., New York, N. Y. 1945. 248 pp.

CITY PLANNING: HOUSING — By Werner Hegemann. Vol. III: A GRAPHIC REVIEW OF CIVIC ART, 1922-1937. Editors: William W. Forster and Robert C. Weinberg. Architectural Book Publishing Co., New York, N. Y. 1938. 162 pp.

CITY PLANNING, WHY AND HOW — By Harold MacLean Lewis. Longmans, Green and Co., New York, N. Y. 1939. 257 pp.

GREENBELT CITIES: THE BRITISH CONTRIBUTION — By F. J. Osborn. Faber and Faber Ltd., 24 Russell Square, London W. C. 1. 1946. 191 pp.

HARVARD CITY PLANNING STUDIES — Harvard University Press, Cambridge, Mass. Thirteen volumes, published in various years.

Volume I: AIRPORTS — By Henry V. Hubbard, Miller McClintock, and Frank B. Williams. 190 pp.

Volume II: BUILDING HEIGHT, BULK, AND FORM — By George B. Ford. 188 pp.

Volume III: NEIGHBORHOODS OF SMALL HOMES — By Robert Whitten and Thomas Adams. 205 pp.

Volume IV: URBAN LAND USES — By Harland Bartholomew. 174 pp.

Volume V: TRANSITION ZONING — By Arthur C. Comey. 150 pp.

Volume VI: THE DESIGN OF RESIDENTIAL AREAS — By Thomas Adams. 296 pp.

Volume VII: MODEL LAWS FOR PLANNING CITIES, COUNTIES, AND STATES — By Edward M. Bassett, Frank B. Williams, Alfred Bettman, and Robert Whitten. 137 pp.

Volume VIII: BUILDING LINES AND RESERVATIONS FOR FUTURE STREETS — By Russell VanNest Black. 243 pp.

Volume IX: THE STEADYFLOW TRAFFIC SYSTEM — By Fritz Malcher. 91 pp.

Volume X: BIBLIOGRAPHY OF PLANNING, 1928-1935 — By Katherine McNamara. 232 pp.

Volume XI: PARKWAYS AND LAND VALUES — By John Nolen and Henry V. Hubbard. 139 pp.

Volume XII: URBAN BLIGHT AND SLUMS — By Mabel L. Walker. 458 pp.

Volume XIII: CITY AND REGIONAL PAPERS — By Alfred Bettman. Edited by Arthur C. Comey. 294 pp.

LOCAL PLANNING ADMINISTRATION — By Ladislas Segoe and collaborators. International City Managers' Association, 1313 East 60 St., Chicago 37, Ill. 1941. 699 pp.

MASTERING A METROPOLIS — By R. L. Duffus. Harper & Brothers, New York. 1930. 302 pp.

NEW CITIES FOR OLD — By Louis Justement. McGraw-Hill Book Co., Inc., New York, N. Y. 1946. Illus. 227 pp.

OUTLINE OF TOWN AND CITY PLANNING — By Thomas Adams. Russell Sage Foundation, 130 East 22 St., New York. 1935. 368 pp.

PRINCIPLES OF URBAN REAL ESTATE — By Arthur M. Weimer and Homer Hoyt. Ronald Press Company, New York. 1939. 332 pp.

REHOUSING URBAN AMERICA — By Henry Wright. Columbia University Press, New York. 1935. 174 pp.

THE CITY IS THE PEOPLE — By Henry S. Churchill. Reynal & Hitchcock, Inc., New York 18, N. Y. 1945. 186 pp.

Books

THE COMMUNITY BUILDERS HANDBOOK — By Community Builders Council of the Urban Land Institute, 1737 K St. N.W., Washington 6, D. C. 1947. 205 pp.

THE CULTURE OF CITIES — By Lewis Mumford. Harcourt, Brace and Company, New York. 1938. 586 pp.

THE FUTURE OF HOUSING — By Charles Abrams. Harper & Brothers. 1946. 428 pp.

THE MASTER PLAN — By Edward M. Bassett. Russell Sage Foundation, 130 East 22 St., New York. 1938. 151 pp.

THE NEIGHBORHOOD UNIT PLAN: A SELECTED BIBLIOGRAPHY WITH INTERPRETATIVE COMMENTS — Compiled by James Dahir. Russell Sage Foundation, 130 East 22 St., New York. 1947. 91 pp.

THE PLANNING OF THE MODERN CITY — By Nelson P. Lewis. John Wiley & Sons Inc. New York. 1922. 457 pp. Note: A new edition, in two volumes, prepared by Harold M. Lewis, is scheduled for publication in 1948.

THE REBUILDING OF BLIGHTED AREAS — By Clarence Arthur Perry. Regional Plan Association, New York. 1933. 59 pp.

YOUR CITY TOMORROW — By Guy Greer. The Macmillan Co., New York, N. Y. 1947. 210 pp.

ZONING — By Edward M. Bassett. Russell Sage Foundation, 130 East 22 St., New York, N. Y. 1936. 275 pp.

Pamphlets

ACTION FOR CITIES — Public Administration Service, 1313 East 60 St., Chicago 37, Ill. 1943. 77 pp.

AUTOMOBILE PARKING IN CENTRAL BUSINESS DISTRICTS — Technical Bulletin No. 6. Urban Land Institute, 1737 K St. N.W., Washington, D. C. July 1946. Tables. 15 pp.

BALANCED REBUILDING OF CITIES — By United States Chamber of Commerce, Washington, D. C. 1937. 12 pp.

COMMUNITIES FOR LIVING — By F. Stuart Chapin, Jr., in collaboration with Sam Schiller, University of Georgia Press, Athens, Ga. 1941. 56 pp.

COMMUNITY PLANNING FOR YOUNGER CITIZENS — New England Town Planning Association, 126 Newbury St., Boston, Mass. 1943. 32 pp.

KNOW YOUR TOWN'S FUTURE — League of Women Voters of the United States, 726 Jackson Place, Washington 6, D. C. 1945. 34 pp.

LOCAL PLANNING AND ZONING: A MANUAL OF POWERS AND PROCEDURES FOR CITIZENS AND GOVERNMENTAL OFFICIALS — Bureau of Planning, Department of Commerce, Albany, N. Y. 1946. 67 pp.

LONG-RANGE PROGRAMMING OF MUNICIPAL PUBLIC WORKS — National Resources Planning Board. Superintendent of Documents, Washington, D. C. 1941. 72 pp.

MISTAKES WE HAVE MADE IN COMMUNITY DEVELOPMENT — By J. C. Nichols. Technical Bulletin No. 1, Urban Land Institute, 1737 K St. N.W., Washington 6, D. C. 1945. 8 pp.

NEIGHBORHOOD DESIGN AND CONTROL: AN ANALYSIS OF THE PROBLEMS OF PLANNED SUBDIVISIONS — By Henry S. Churchill and Roslyn Ittleson, National Committee on Housing, 512 Fifth Ave., New York 18, N. Y. 1944. 40 pp.

OUR CITIES — By National Resources Committee, Superintendent of Documents, Washington, D. C. 1937. 35 pp.

PLANNING CITIES FOR TODAY AND TOMORROW — By Fred A. Crane. Row Peterson and Co., Evanston, Ill. 1942. 48 pp.

PLANNING FOR THE SMALL AMERICAN CITY — By Russell VanNest Black. Public Administration Service, 1313 East 60 St., Chicago 37, Ill. Revised 1944, 86 pp.

PLANNING YOUR COMMUNITY — By C. Earl Morrow, Regional Plan Association, Inc., 205 East 42 St., New York 17, N. Y. 1945. 42 pp.

SMALL TOWN MANUAL FOR COMMUNITY ACTION — Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Superintendent of Documents, Washington, D. C. 1942. 42 pp.

Pamphlets

STANDARDS FOR NEIGHBORHOOD RECREATION AREAS AND FACILITIES — National Recreation Association, 315 Fourth Ave., New York 10, N. Y. 13 pp.

THE PEOPLE DESIGN THE CITY — By California State Reconstruction and Reemployment Commission, 631 J Street, Sacramento 14, California. Pamphlet No. 13, June 1947. 28 pp.

WHY CITY PLANNING IS YOUR RESPONSIBILITY — By Oscar Stonorov and Louis I. Kahn. A booklet in the "Better Living Series." Revere Copper and Brass, Inc., 230 Park Ave., New York, N. Y. 1943. 14 pp.

YOU AND YOUR NEIGHBORHOOD: A PRIMER FOR NEIGHBORHOOD PLANNING — By Oscar Stonorov and Louis I. Kahn. Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N. Y. 1944. Illus. 99 pp.

YOUR BUILDING CODE — By Miles L. Colean. National Committee on Housing, Inc., 512 Fifth Ave., New York 18, N. Y. 1946. 30 pp.

YOUR STAKE IN COMMUNITY PLANNING — National Committee on Housing, Inc., 512 Fifth Ave., New York 18, N. Y. 1944. Illus. 27 pp.

Periodicals

JOURNAL of the American Institute of Planners, 77 Massachusetts Ave., Cambridge, Mass. Quarterly. About 48 pp.

NEWSLETTER of the American Society of Planning Officials, 1313 East 60 St., Chicago 37, Ill.

PLANNING AND CIVIC COMMENT — American Planning and Civic Association, Union Trust Bldg., Washington, D. C. Quarterly.

ABOUT BOSTON AND MASSACHUSETTS

A CHILDREN'S GUIDE TO BOSTON — By Leonard L. Knott. Editorial Associates, Boston, Mass. 1946. 29 pp.

AIRPORT PROGRAM, MASSACHUSETTS BAY AND ENVIRONS — By State Planning Board, 11 Beacon Street, Boston. 1946. 39 pp.

BOSTON'S IMMIGRANTS, 1790-1865 — By Oscar Handlin. Harvard University Press, Cambridge, Mass. 1941. 287 pp.

BOSTON MUNICIPAL REGISTER — By the Statistics Department, City of Boston, 1947. 149 pp.

FIFTY YEARS OF BOSTON, A MEMORIAL VOLUME — By Boston Tercentenary Committee, Elisabeth M. Herlihy, Chairman. 1932. 799 pp.

GUIDING THE BUILDING BOOM — By Greater Boston Development Committee, Inc., 80 Federal St., Boston 10, Mass. 1947. 21 pp. and map.

HISTORIC BOSTON IN FOUR SEASONS: A CAMERA IMPRESSION — By Samuel Chamberlain. Hastings House, New York. 1938. 74 pp.

METROPOLIS IN MAPS — By Bureau for Research in Municipal Government, Harvard Graduate School of Public Administration, Cambridge, Mass. 1946. 87 pp.

PARK, PARKWAY AND RECREATIONAL AREA STUDY — By Massachusetts State Planning Board in cooperation with U. S. Department of Interior, National Park Service. 1941. 121 pp.

REPORT OF THE LEGISLATIVE COMMISSION ON RAPID TRANSIT, Commonwealth of Massachusetts, The State House, Boston, Mass. 1947. 62 pp.

REPORT ON A THOROUGHFARE PLAN FOR BOSTON — By the City Planning Board, Robert Whitten, Consultant. 1930. 236 pp.

REPORT ON MASSACHUSETTS STATE HIGHWAY NEEDS, EXCLUSIVE OF METROPOLITAN BOSTON — By Massachusetts Department BOSTON — By Massachusetts Department of of Public Works. 1947. 16 pp.

SOMETHING OLD, SOMETHING NEW, THAT'S BOSTON — By Convention Bureau, Boston Chamber of Commerce. 1947.

THE BOSTON BOOK — By Arthur Griffin (photographs) and Esther Forbes (text). Houghton Mifflin Co., Boston, Mass. 1947. 122 pp.

THE MASSACHUSETTS LAW OF PLANNING AND ZONING — By Philip Nichols. The Massachusetts Federation of Planning Boards. 1943. 273 pp.

THE MASTER HIGHWAY PLAN FOR THE BOSTON METROPOLITAN AREA — By the Joint Board for the Metropolitan Master Highway Plan. The State Planning Board, 11 Beacon St., Boston, Mass. 1948. 124 pp. and maps.

THE MEMORIAL HISTORY OF BOSTON, 1630-1880 — Edited by Justin Winsor. Ticknor and Company, Boston, Mass. Four Volumes. 1880.

GLOSSARY

abatement. Reduction in degree or intensity.

abutting. Touching along a border; adjacent.

acclaim. Applause.

acquisition. Act of obtaining; a thing obtained.

administrative. Having to do with management, or with the executive functions of government.

aggregate. To collect or unite into a sum.

amortization. The process of providing for the gradual paying off of a debt.

antiquated. Grown old; outmoded.

apartment house. A residential building housing more than three families in separate flats. Generally implies a modern building, while a "tenement" implies an outmoded building.

appropriation. Money set apart by formal action to a specific use.

arcade. A series of arches with supporting columns, covering a sidewalk or street.

artery. An important traffic street or highway.

artesian well. A well made by boring into the earth till water is reached which, from internal pressure, flows spontaneously.

assessment. A tax; a special assessment is a tax levied on real estate for a particular purpose, or to pay for a service from which the real estate receives a benefit.

belt-line highway. A highway completely encircling a district, city or region; a circumferential highway.

belt-route. Same as belt-line highway.

blight. Decay.

blighted area. A district in which the buildings are decayed, old, outmoded and substandard. Sometimes a good residential area is said to be *blighted* by the presence of industrial plants.

bottleneck. A narrow or constricted way of passage.

boulevard. A broad avenue, usually planted with trees or grass, and often divided into two or more roadways by narrow planting strips.

budget. A financial statement of estimated income and expenses for a definite period of time, such as one year.

by-pass. A road passing to one side of an area.

capital budget and program. A financial statement of estimated costs of permanent public improvements, with suggested methods for paying these costs. A *capital budget* is usually for a period of one year; and a *capital program* is for a period of several or many years.

capital cost. The total amount of expenditure required for the construction of a permanent improvement, as distinct from the "operating cost" or the "annual cost."

canyon. A deep valley with high steep slopes; by analogy, a narrow street flanked by tall buildings.

caravan. A covered vehicle used to carry freight and people; a company of travellers or traders on a journey through desert or hostile regions.

cargo shed. A building, of one or two stories, erected on a pier or dock and used for the handling and temporary storage of cargo.

centralization. Concentration at or around a center; the process of bringing into one system or under one control.

circuitous. Roundabout; indirect.

circumferential highway. A continuous highway encircling a district, city or region.

civic center. A grouping of public and semi-public buildings on one site, or around a square or plaza.

clover leaf intersection. The crossing of two main highways, when it includes a system of connecting roads to provide for both right and left-hand turns for each direction of travel from each highway, in such a way that no two streams of traffic cross each other. The roadway pattern resembles a four leaf clover.

colonnade. A series of columns at regular intervals.

commemorative. Calling to remembrance, or serving as a memorial of.

commutation } The act of travelling regularly,
commuting } morning and night, between a home in the suburbs and a place of work in the city.

consolidate. To combine into one body.

constituent. adj. Serving to form or make up; component. n. A component; any resident of a political district represented by an elected officer.

constitute. To form; to establish, as a law.

contiguous. In contact; adjoining; abutting.

contour. The outline of a body or mass; the line or lines representing such an outline.

converge. To tend to one point; to approach nearer together.

cooperation. The collective action of two or more persons or groups.

coordinate. To bring into common action; to harmonize.

counteract. To frustrate by contrary agency.

cove. A small sheltered inlet or bay.

cul-de-sac street. A dead-end street, often with a turning circle for vehicles at its end.

decentralization. The process of distribution or spreading out of what has previously been united or concentrated.

decrepit. Broken down with age; worn out.

deficiency. A shortage; deficit.

demolish. To pull down, as a building.

deterioration. Impairment of quality, character or value, as a neighborhood.

detrimental. Damaging; disadvantageous.

diesel-electric locomotive. A railroad locomotive driven by electric motors, which are supplied with electricity generated by an internal combustion engine using fuel oil as the source of energy.

diesel-electrification. The process of converting a railroad from operation with steam locomotives to operation with diesel-electric locomotives.

dilapidated. Falling or fallen into partial ruin or decay.

dilemma. A situation involving choice between equally unsatisfactory alternatives.

dissension. Disagreement in opinion; discord.

diversification. The fact of having variety; the achieving of variety.

drastically. With extreme effect.

eliminate. To remove or get rid of; to exclude.

emit. To give off, as fire *emits* smoke.

enabling act. A legislative law giving power to a subordinate agency of government to perform certain specified functions.

enactment. The passage of a law.

enforcement. The process of giving effect to the provisions of a law or regulation.

engulf. To swallow up, as in a gulf.

enhance. To increase; to advance or elevate.

enlightened. Free of ignorance or error; well-informed.

environment. The surroundings; the aggregate of all the external conditions and influences affecting the life and development of a group of people constituting a community.

environs. The suburbs round about a city; the surroundings.

envisage. To view with the mind's eye.

equilibrium. A state of balance between opposing forces, actions or influences.

era. A period of history; an epoch.

evolve. To develop gradually.

exodus. A going out or departure.

expediency. State of being advisable; or of serving a means toward a desirable end.

express highway } A major traffic thoroughfare
expressway } designed for continuous flow of vehicles, with no traffic lights and only infrequent or limited access from adjacent streets and abutting property.

facade. The face or front of a building.

feasible. Capable of being done; practicable.

feature story. A special account of a particular subject, in a newspaper or periodical.

feeder bus line. A bus line located so as to bring passengers from suburban areas to an important station of a transit system — usually to the outlying terminus of a street car, subway or elevated route.

feudal. Pertaining to the political system of the Middle Ages, which determined the relations between lord and vassals.

filtering down of homes. The process by which homes become vacant when their previous occupants move to newer or better quarters.

forehanded. Mindful of the future.

forthright. Direct; frank; straightforward.

foster. To sustain, promote or encourage.

freeway. An express highway to which abutting property has no legal rights of access.

fruition. State of bearing fruit; hence, realization.

frustration. Prevention from attaining a purpose; state of being rendered ineffectual.

garden city. A small self-contained city with its own residential, business and industrial districts — the whole being encircled by a belt of parks and other permanent open lands.

general cargo. Miscellaneous freight, as distinct from freight that is all of one kind or class — such as oil.

gridiron street pattern. A rectangular arrangement of city streets, with all intersections at right angles.

guildhall. The meeting place of an association of men engaged in the same occupation, as the silversmiths' *guildhall.*

haphazard. Random; irregular; determined by chance.

helicopter. A form of aircraft whose support in the air is derived solely from the reaction of a stream of air driven downward by propellers revolving around a vertical axis.

hodge-podge. A mixture; usually an undesirable mixture.

impartial. Not favoring one more than the other; equitable; just.

impetus. Impulse; incentive, stimulus.

implication. Something implied that gives ground for an inference.

inception. Beginning.

inconsistency. A relationship between ideas such that both (or all) cannot be true.

incursion. A sudden invasion; raid; inroad.

inevitable. Incapable of being avoided; bound to happen.

inexorable. Inflexible; relentless.

influx. An inpouring.

infringe. To encroach.

installation. The act of placing in position, use or service.

interchange. v. To put each in the place of the other. n. A mutual exchange.

interlocking. Firmly engaged or inter-related with one another.

intermingle. To mix or blend together.

intrinsic. Belonging to the nature of a thing, as distinct from that which is external or acquired.

intrusion. Encroachment; entrance without leave or welcome.

jumbled land uses. Undesirable mixture in one block or neighborhood of residential, business or industrial properties.

junction. The place where lines of a railway meet or cross.

jurisdiction. Sphere or scope of authority.

lavishness. Extravagance; profusion.

loading bay. A space underneath a building, or adjacent to it on private property, which is designed for accommodation of a truck to be loaded or unloaded.

long-range. Extending over a considerable term of years.

mainstay. The principal support.

master plan. A comprehensive design or layout, giving effect to the inter-relationship of several factors or component parts.

maze. A confusing network, as of paths or streets.

metropolis. A large city together with the smaller cities and towns that cluster round it; an urban region; a parent city plus the area beyond its borders, which is under its direct economic and cultural influence.

metropolitan. Pertaining to a metropolis.

Middle Ages. The period of European history between the fall of the Roman Empire and the revival of letters and the arts: usually considered to extend from about 475 A.D. to 1450 A.D.

moat. A deep wide trench around a castle or town, usually filled with water.

monotony. Sameness; want of variety; especially, wearisome sameness.

multiplicity. Quality of consisting of many things of one or similar kind.

municipality. A town, city or other political division having powers of local self-government.

naturalized citizen. A person born in a foreign country who later acquires the nationality of a country other than that of his birth.

network. Any system of lines or streets interlacing like the fabric of a net, so as to form a regular or irregular pattern.

news release. A written statement of news or policy given out to the newspapers.

obliterate. To blot out; to erase; to destroy.

obnoxious. Offensive, objectionable, as of odors.

obsolescence. The state of going out of use; or of becoming out-of-date.

ostentation. Unnecessary or pretentious show or display.

overpass. A bridge to carry highway or railroad traffic (or pedestrians) over another highway or railroad.

parkway. Part of a park system, laid out as a highway or boulevard for vehicular traffic, and usually restricted to passenger cars.

participating. Having a share in common with others.

pay-load. That part of the load which pays to be transported. The *pay-load* of an airplane includes the passengers, freight and mail, but excludes the gasoline and crew.

perpetuate. To give an enduring character or existence to.

phenomenal. Rare or of unique significance; exceptional.

piecemeal. Piece by piece; by degrees; fragmentary.

play field. See illustration on page 85.

play lot. See illustration on page 84.

portage. A carrying of boats, goods, etc. overland between navigable waters; also, the route over which they are so carried.

precarious. Insecure; exposed to hazards.

pre-cast concrete. Concrete that is cast in molds or forms at a factory, instead of at the job.

precedent. Something that is done or said that may serve as an example to authorize or justify a subsequent act of the same or similar kind.

predecessor. One who has preceded another in any position or office.

preempt. To appropriate or use to the exclusion of others.

premature subdivision of land. The cutting up of vacant land into streets and residential building lots, in advance of true demand for the construction and sale of houses.

prerequisite. Required as a preliminary to some proposed action.

priority. Status of being entitled to first place or precedence, because more important.

prospective. Expected confidently.

public hearing. A meeting called by a government agency, which is open to the general public and at which anyone has the right to be heard.

quota. A proportional part or share; the number of people determined by law or regulation, as "the annual *quota* of immigrants from Italy."

radial highway. A traffic artery extending from near the center of a city or region outward to or beyond its boundaries. Compare *radius* of a circle.

ramp. A sloping roadway connecting two streets that are built one above the other, or side-by-side on different levels.

rapid transit. Buses, street cars or trains running on elevated structures, in subways, or on private rights-of-way with infrequent stations or stops. Contrast buses or street cars running on downtown city streets.

rationally. Logically; reasonably.

redevelopment. The process of tearing down old buildings, replanning the locations of streets, and rebuilding with new structures.

rehabilitation. Repair and remodelling, as contrasted with redevelopment.

rejuvenation. State of being rendered young again.

requisite. Required.

right-of-way. The strip of land over which a highway or railroad is built.

row houses. Houses built in rows with party walls, that is with no space between them.

segregate. To separate; to set apart.

serried. Pressed together in ranks or rows.

sewerage system. A system or connected series of sewers designed to carry sewage, rainwater, or both.

short-haul. For a short distance — applied to freight and passenger service of railroads, etc.

siphoning off. Drawing off as by a siphon; attracting away.

skilled workers. Workmen who have acquired special knowledge and ability in a particular trade or type of work, as the result of training and experience.

sparse. Thinly scattered — opposite of thickly settled.

specifically. Explicitly.

speculation. Entering into a commercial transaction the profits of which are subject to chance or not accurately predictable.

squalor. Miserable and ill-kept condition.

stability. State of being fixed in location, steady or enduring.

standby airfield. A secondary airfield intended to be used when a more important field is out of service for any reason, such as foggy weather.

structural. Pertaining to the manner or type of construction, as *structural* safety.

subdivision. The cutting up of vacant land into streets and building lots.

subsidize. To give financial aid to.

suburban. Pertaining to the area situated near a large city.

super-block. A city block formed by eliminating several streets, so that two or more blocks are made into one large block.

superhighway. Same as express highway.

Taoist. A follower of a religion and philosophy of China traditionally founded in the 6th century B.C.

tempo. The rate of activity.

tenement. A residential building housing more than three families in separate flats. Generally implies an outmoded building, constructed many years ago.

terminus. The end of a railroad or transportation line; also the station at the end of the line.

three-decker. A residential building housing three families, each on a separate floor.

tidal land. Land that is above water at low tide but covered at high tide.

topography. The configuration of a land surface, including its hills and valleys and the position of its streams and lakes.

tortuous. Full of twists or curves; winding.

trackless trolley. A passenger vehicle, not operating on rails, and similar to a bus, but obtaining its power from overhead electric lines.

transit. Carrying of fare-paying passengers in buses, street cars, etc. (Subways and elevateds are referred to as rapid *transit.*)

trunk line railroad. A railroad operating over a long distance with large metropolises as its termini.

trunk sewer. A large main sewer, into which small local sewers discharge their contents.

underpass. A passageway for highway or railroad traffic (or pedestrians) under another highway or railroad.

unpredictable. Not capable of being foreseen.

unskilled workers. Workmen who do not have special training for a skilled trade.

validity. The state of being founded on truth or fact.

vicinity. Nearness; a community near or adjacent; a neighborhood.

vista. A long view, especially along an avenue, as between rows of trees.

vocational training. Education for a business, trade, or profession.

warehouse. A building for the storage of merchandise or freight.

wholesale. The sale of goods in large quantities; usually the sale by a manufacturer to stores or agents, as contrasted to *retail sale* by the store to individual customers.

zoning. The partitioning (of a city, etc.) by ordinance into districts so as to regulate the height, area and use of buildings, the use of land, and the density of population.

FLEISCHMANN'S

PM